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THE SOURCE LOCATOR: A DIRECTORY OF  
INFORMATION SOURCES IN SMALL ARMS  
TECHNOLOGY, AND THESAURUS

Systems Consultants, Incorporated

Prepared for:

Army Small Arms Systems Agency

January 1973

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# THE SOURCE LOCATOR

A Directory of Information Sources  
in Small Arms Technology

and

Thesaurus

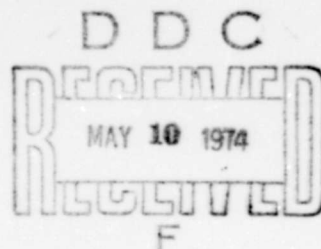
Compiled by

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New York, New York 10019

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January 1973



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## Foreword

This document, THE SOURCE LOCATOR, A Directory of Information Sources in Small Arms Technology and Thesaurus, was compiled for the US Army Small Arms Systems Agency, Aberdeen, MD by Systems Consultants Incorporated, New York, NY, under contract DAAD-05-72-C-0342.

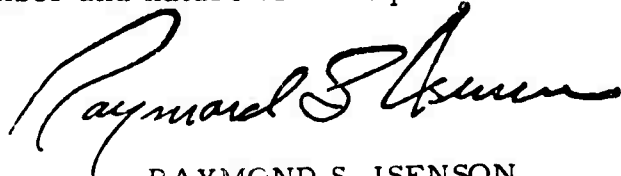
This document is a product of SASA's program to facilitate identification and utilization of existing information sources and technical expertise in small arms technology through development of a Small Arms Technical Information Network (SATIN).

THE SOURCE LOCATOR will provide its users with ready access to individually and organizationally resident expertise in a spectrum of technology areas relevant to the design, development, manufacture, and utilization of small arms and small arms ammunition. In this context, 'small arms' includes guns and ammunition up to 20mm cannon and 40mm grenade.

In addition to the subject indexed directory a first edition Thesaurus of Small Arms Terminology has been compiled and is included as an appendix. It will serve the directory user as a guide for selection of alternative search terms and will aid in the standardization of the terminology used by the community.

As a first edition, this document neither presumes to be, nor is intended to be exhaustive in its coverage. It is, instead, a "Test-Bed" and is intended to be representative and useful as it stands to the small arms community. The ultimate inclusion of those individuals and organizations who should be included, and perhaps of additional subject areas and Thesaurus terminology must await subsequent editions, the publication of which will be dictated by the reception this first edition gets by the small arms community.

We therefore ask you the reader to use this document as the need arises, and then to take a few moments to tear out, fill out, and send us a self addressed 'users critique card' from the back of this directory. Since our aim is to produce a directory maximally useful to you, your replies are most important; they will ultimately dictate the number and nature of subsequent editions.



RAYMOND S. IENSON  
Colonel, FA  
Commanding

## Introduction

THE SOURCE LOCATOR contains four sections and one appendix:

- Section I Government Personnel
- Section II Information Handling Activities
- Section III Industrial Sources
- Section IV Subject Sources
- Appendix A Thesaurus of Small Arms Terminology

Section I (blue) is an alphabetical arrangement of personal data sheets for government and military personnel. Enough data is provided for each person included to provide THE SOURCE LOCATOR's user with a reasonably well founded basis for deciding whether that individual may be a source of the information sought.

Section II (pink) contains similar alphabetical data for information handling activities such as libraries at government facilities, data bases and information analysis centers.

Section III (green) contains similar alphabetical data for companies in the small arms industry and for private consultants.

Section IV (white) is a subject index covering section I-III. Two types of subject terms are included unstarred terms and starred terms (\*). Unstarred terms are those for technical areas included in the Thesaurus (appendix). Starred terms include all other technical areas not yet in the current Thesaurus edition and all program names, item names, and type classifications. Program names include all those submitted by the listed individuals (we, therefore, cannot guarantee their accuracy).

Appendix A (tan) is a Thesaurus of Small Arms Terminology showing the syntactical relationship of the listed words (descriptors). It is used as a guide to information searches. Starting with a particular term of interest, those terms associated with broader, narrower and related subject areas are given. This allows the user to expand his search in the desired direction or to select alternative search terms. It also provides a standardized terminology so that "correct" descriptors are used in information searches. Four digit numbers following particular descriptors are corresponding Subject Category Field and Group designations as used in the Thesaurus of Engineering and Scientific Terms (Office of Naval Research and Engineers Joint Council, 1967 - available from NTIS: AD 672000) which served as a model for this thesaurus.



Although every attempt has been made to produce as accurate a document as possible, the information presented is essentially that provided by the included parties. Hence, we cannot be responsible for its accuracy. Program and device names and designations as well as the level of detail presented are as has been provided to us. Parties wishing to be included or to modify their current listing are invited to submit such information, in the format used by this directory, to Systems Consultants Incorporated, Attn: SATIN, 221 West 57th Street New York, New York 10019.

Please Note-

Users should be aware of the security classification associated with the subjects upon which they request information and should conduct their communications accordingly.

Users are reminded that this directory is neither intended to be a vehicle for circumventing restrictions on dissemination of specific information nor for circumventing normal administrative channels or task ordering and procurement procedures.

Users should use consideration and discretion in the selection of contacts, in the exchange of information, and in the requests made for other's (free) time. The success of this program depends on it.

### Acknowledgements

This directory was prepared by the Management And Data Systems Division of Systems Consultants, Incorporated, W. E. Landauer, Vice President and Division General Manager. The program was managed by Mr. J. H. Golden, who wishes to express his thanks to Mr. Richard Altman, Mrs. Edith Ward and Mr. Frank Gonyer, each of whom made substantial contributions to the generation of this directory; to COL Raymond Isenson, Commanding Officer, U. S. Army Small Arms Systems Agency, for his interest in this work, and to Mr. Carl Bysura of USASASA, Project Engineer, for his constructive criticism and for his assistance in facilitating our work within the Small Arms Community.

**SECTION I**

**GOVERNMENT PERSONNEL**

**Ackley, James**  
**Team Leader, Future Rifle Systems Program**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: SWERR-S-DI (Mr. James Ackley)**  
**Rock Island, IL 61201**

**Autovon: 793-4661**  
**Telephone: (309) 794-4661**

<b>Organization</b>	<b>Small Arms Weapon Systems Directorate Weapons Laboratory Individual Weapons Section</b>
<b>Technical Areas</b>	<b>Interior and Exterior Ballistics; Weapon Design; Cartridge Design.</b>
<b>Specialties</b>	<b>Test instrumentation; Test design, and performance; Ballistic parameters; Weapon parameters.</b>
<b>Programs</b>	<b>Future Rifle System; M16A1 Rifle/M203 Grenade Launcher.</b>
<b>Papers</b>	<b>Papers on design and evaluation testing of various aspects of the M16A1 rifle/M203 grenade launcher weapon system, M14 rifle, and M1 rifle systems.</b>
<b>Remarks</b>	<b>Alternate contact: Mr. J. Post</b>
<b>Descriptors</b>	<b>Ballistic tests Weapons tests</b>

**Ambrosini, Leonard**  
**Technical Director**

**Commanding Officer**  
**U. S. Army Small Arms Systems Agency**  
**ATTN: AMXAA-TD (Mr. L. Ambrosini)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-2533**  
**Telephone: (301) 278-2533**

<b>Organization</b>	<b>Small Arms Systems Agency</b>
<b>Technical Areas</b>	<b>All aspects of small arms weapon system R&amp;D.</b>
<b>Specialties</b>	<b>Weapon mechanisms; Weapon dynamics; Advanced weapon system concepts; Automatic weapons of all types; Caseless ammunition; Aluminum, plastic, and thin steel cartridge cases; Barrel technology; Lubrication technology; Advanced fuzing concepts (30-40mm granade).</b>
<b>Programs</b>	<b>Dual Cycle Rifle System; Squad Automatic Weapon (SAW); Future Rifle System (FRS); Port Firing Weapon - MICV; Personal Defense Weapon.</b>
<b>Papers</b>	<b>Numerous papers, presentations, and patents in above areas</b>
<b>Descriptors</b>	<b>Automatic weapons Cartridge cases Fuzes Gun barrels Lubrication Weapon dynamics</b>

**Ames, Vernon G.**  
**Mechanical Engineer, Climatic Section, Environmental Branch**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-K3400 (Mr. Vernon G. Ames)**  
**Philadelphia, PA 19137**

**Autovon: 348-5868**  
**Telephone: (215) 831-5868**

**Organization**                      **Test and Evaluation Division**  
                                         **Technical Support Directorate**

**Technical Areas**                      **Environmental testing; Horology.**

**Specialties**                      **Planning, coordinating, analyzing and reporting**  
                                         **environmental tests on SAA, fire control and**  
                                         **fuzes (particularly shock and vibration aspects);**  
                                         **Testing, evaluating and utilizing watches, clocks**  
                                         **and various timing devices; Horology**

**Programs**                      **SPIW: M7 and M8 Sequential Timers;**  
                                         **Message Center Clock; XM35 Timer.**

**Descriptors**                      **Environmental testing**  
                                         **Timing fuzes**

**Ash, Dennis**  
**Product Engineer**

**Commanding General**  
**Headquarters, U. S. Army Weapons Command**  
**ATTN: SWERR-S-P (Mr. Dennis Ash)**  
**Rock Island, IL 61201**

**Autovon: 793-4667/4521**  
**Telephone: (309) 794-4667/4521**

<b>Organization</b>	<b>Product Engineering Group</b> <b>Small Arms Weapon Systems Directorate</b> <b>Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Product engineering</b>
<b>Specialties</b>	<b>Configuration management; Technical data preparation.</b>
<b>Programs</b>	<b>M85 Machine Gun, Cal. .50; M73A1/M219 Machine Gun 7.62mm; Browning Machine Guns, Cal. .30 and Cal. .50, with related accessories, e.g., mounts, links, etc...</b>
<b>Descriptors</b>	<b>Machine guns</b> <b>Technical data packages (TDP)</b> <b>Weapons production</b>

Baer, John Larry  
Chief, Weapon Systems  
Synthesis Division

Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-WS (Mr. John Larry Baer)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5267/4641  
Telephone: (301) 278-5267/4641

**Technical Areas**

Small arms systems; Light weight armor; Pyrotechnic devices.

**Specialties**

Program management

**Programs**

Future Rifle System/Flechettes, Bullets; Squad Automatic Weapon/ Light Machine Gun; Personal Defense Weapon Systems; Grenade Launchers and Ammunition.

**Papers**

Numerous papers on armor; aerodynamic heating of projectiles, ammunition and specialty device design and R & D program management.

**Remarks**

Professional Engineer

**Descriptors**

Flechettes  
Grenades  
Grenade launchers  
Lightweight armor  
Machine guns  
Pyrotechnics



**Baer, Paul G.**  
**Physicist, Applied Ballistics**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BIL (Mr. Paul G. Baer)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-3574**  
**Telephone: (301) 278-3574**

<b>Organization</b>	<b>Internal Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
<b>Technical Areas</b>	<b>Interior ballistics; Thermodynamics</b>
<b>Specialties</b>	<b>Mathematical models; Computer simulation.</b>
<b>Programs</b>	<b>Interior ballistic mathematical modeling.</b>
<b>Papers</b>	<b>Papers on math modeling of guns, propellant thermodynamics, high-velocity guns, light gas guns.</b>
<b>Remarks</b>	<b>Contact Mr. Frankle, Branch Chief, as an alternate.</b>
<b>Descriptors</b>	<b>Computer simulation</b> <b>Interior ballistics</b> <b>Mathematical models</b> <b>Thermodynamics</b>

**Baran, Anthony**  
**Mechanical Engineer**  
**Dynamics Branch**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BIL (Mr. Anthony Baran)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-4443**  
**Telephone: (301) 278-4443**

<b>Organization</b>	<b>Interior Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
<b>Technical Areas</b>	<b>Weapon dynamics</b>
<b>Specialties</b>	<b>Helicopter arms, Vehicle rapid fire weapons.</b>
<b>Programs</b>	<b>Bushmaster; XM140; Hispano Suiza; DESVAL-Design evaluation of 20-40mm weapon systems; M139; TRW 6425</b>
<b>Descriptors</b>	<b>Rapid fire weapons</b> <b>Weapon dynamics</b>

**Baldini, Luigi F.**  
**Physicist**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-K4000 (Mr. Luigi F. Baldini)**  
**Philadelphia, PA 19137**

**Autovon: 348-5703**  
**Telephone: (215) 831-5703/6338**

<b>Organization</b>	<b>Test and Instrumentation Division</b> <b>Technical Services Directorate</b>
<b>Technical Areas</b>	<b>Terminal ballistics; Exterior ballistics;</b> <b>Interior ballistics; Transitional ballistics;</b> <b>Sabot technology.</b>
<b>Specialties</b>	<b>Performance and analysis of terminal</b> <b>ballistics testing with flechettes and High</b> <b>Velocity Armor Piercing (HVAP); Chunky</b> <b>fragments.</b>
<b>Programs</b>	<b>Future Rifle Systems; ACT (formerly</b> <b>DESVAL).</b>
<b>Papers</b>	<b>Papers on terminal ballistic data for</b> <b>fragments, cubes, rods or flechettes and</b> <b>HVAP type penetrators when tested against</b> <b>steel, aluminum and ceramic composite</b> <b>targets.</b>
<b>Remarks</b>	<b>Alternate points of contact: Mr. J.R. Kymer,</b> <b>Physics Laboratory (348-6801), Mr. H.E.</b> <b>Fatzinger, Physics Laboratory (348-6801).</b> <b>Patent: Long Rod Sabot.</b>
<b>Descriptors</b>	<b>Flechettes</b> <b>Penetration tests</b> <b>Sabots</b> <b>Terminal ballistics</b>

**Bates, Jack**  
**Program Manager**  
**CPU 2/A Gun Pod.**

**Commander**  
**Naval Weapons Center**  
**ATTN: CODE 3015 (Mr. Jack Bates)**  
**China Lake, CA 93555**

**Autovon: 898-1700 Ext. 2586/2505**  
**Telephone: (714) 939-2586/2505**

<b>Specialties</b>	<b>Testing of aircraft systems.</b>
<b>Programs</b>	<b>20mm Lightweight Gun Pod GPU 2/A.</b>
<b>Descriptors</b>	<b>Aircraft armaments</b> <b>Weapons tests</b>

**Berk, Sigmund**  
**Research Chemist**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-L6000 (Mr. Sigmund Berk)**  
**Philadelphia, PA 19137**

**Autovon: 348-8348/5434**  
**Telephone: (215) 831-5434**

<b>Organization</b>	<b>Chemistry Research Laboratory</b>
<b>Technical Areas</b>	<b>Radioisotopic applications in nondestructive testing.</b>
<b>Specialties</b>	<b>Radioisotope gauges for critical weights of primers, presence or absence of critical parts, isotopic propellant level indicators.</b>
<b>Programs</b>	<b>Propellant level indicators for SCAMP.</b>
<b>Papers</b>	<b>Publications on measuring weight of primer after assembly, non-destructive inspection of internal components, radiation temperature indicating devices, radiation timing devices.</b>
<b>Remarks</b>	<b>Patents in radioisotope nondestructive testing methods for primers, ammunition, etc.</b>
<b>Descriptors</b>	<b>Nondestructive testing</b>

**Bernstein, Charles, N.**  
**Chemist**

**Commanding Officer**  
**U. S. Army Small Arms Systems Agency**  
**ATTN: AMXAA-AC (Mr. Charles N. Bernstein)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-5263/4637**  
**Telephone: (301) 278-5263/4637**

<b>Organization</b>	<b>Advanced Concepts and Technology Division</b>
<b>Technical Areas</b>	<b>Chemistry as it applies to propellant combustion; Interior ballistics.</b>
<b>Specialties</b>	<b>Solid propellants; Propellant chemistry; Caseless propellant; Rocket propellant; Liquid propellants for guns; Interior ballistics; Combustion; Barrel erosion; Flash; Synthesis of propellant ingredients.</b>
<b>Programs</b>	<b>Plastic cartridge cases; Aluminum cartridge cases; Cased propellant; Caseless propellants; Liquid guns; Small rockets; Gun-launched rockets; Tracers.</b>
<b>Papers</b>	<b>A number of papers in above areas</b>
<b>Remarks</b>	<b>Experience also in propellants for large rockets and large caliber guns.</b>
<b>Descriptors</b>	<b>Aluminum cartridge cases Interior ballistics Liquid propellants Plastic cartridge cases Propellants Propellant chemistry Tracers</b>

**Bilsbury, Stephen J. (Maj)**  
**Armament Development Engineer**

**Commander**  
**Headquarters Armament Development and Test Center**  
**ATTN: AFATL-DLDG (Maj Stephen J. Bilsbury)**  
**Eglin Air Force Base, FL 32542**

**Autovon: 872-2163**  
**Telephone: (904) 882-2163**

**Organization** **Air Force Armament Laboratory**

**Technical Areas** **Plastics; Rotating bands; Car-**  
**tridge cases; Projectiles.**

**Descriptors** **Cartridge cases**  
**Plastics**  
**Rotating bands**

**Blair, Richard R. (LTCOL)**  
**Infantry Weapons Officer**

**Commandant**  
**Marine Corps, U. S. Headquarters**  
**ATTN: MC-AO4F (LTCOL Richard R. Blair)**  
**Washington, DC 20380**

**Autovon: 224-1779/1234**  
**Telephone: (202) OX 4-2530**

<b>Organization</b>	<b>G-4 Division</b> <b>Ordnance Branch</b> <b>Headquarters U. S. Marine Corps.</b>
<b>Technical Areas</b>	<b>Manager of USMC Assets of Infantry Weapons.</b>
<b>Programs</b>	<b>M16 Rifle Program; M202 Multi shot flame weapon.</b>
<b>Descriptors</b>	<b>Infantry weapons</b>



**Boldt, Terry (Dr.)**

**Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7200 (Dr. Terry Boldt)  
Philadelphia, PA 19137**

**Autovon: 348-5705  
Telephone: (215) 831-5705**

<b>Organization</b>	<b>Munitions Development and Engineering Directorate</b>
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<b>Technical Areas</b>	<b>Flechettes Holography.</b>
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<b>Programs</b>	<b>Future Rifle System.</b>
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<b>Papers</b>	<b>"Computer program for calculation of Center of Mass and Moments of Inertia of Finned Projectiles".</b>
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<b>Descriptors</b>	<b>Flechettes Holography Transition ballistics</b>
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**Bornheim, George H.**  
**Chief Ammunition Development Branch J7100**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-J7100 (Mr. George H. Bornheim)**  
**Philadelphia, PA 19137**

**Autovon: 348-5505**  
**Telephone: (215) 831-5505**

<b>Organization</b>	<b>Small Caliber Ammunition Division</b> <b>Munitions Development and Engineering Directorate</b>
<b>Technical Areas</b>	<b>Interior, launch, exterior and terminal ballistics; Flechettes; Component design; Complete cartridges design; Caseless ammunition.</b>
<b>Programs</b>	<b>Future Rifle System; Squad Automatic Weapon; Personal Defense Weapon System; Advanced Machine Gun Systems; Ammunition for Stoner Weapon System.</b>
<b>Papers</b>	<b>"Caseless Ammunition Program; Ammunition for Stoner Machine Gun. "</b>
<b>Remarks</b>	<b>Mr. R. Schlenner and Mr. R. Reagan alternate contacts.</b> <b>Professional Engineer-Massachusetts.</b> <b>Two patents on electrical firing systems.</b>
<b>Descriptors</b>	<b>Cartridges</b> <b>Caseless ammunition</b> <b>Exterior ballistics</b> <b>Flechettes</b> <b>Interior ballistics</b> <b>Launch ballistics</b> <b>Terminal ballistics</b> <b>Transition ballistics</b>

Braun, Walter F.  
Chief, Range Section  
Free-flight Aerodynamics Branch

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BEL (Mr. Walter F. Braun)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-3614  
Telephone: (301) 278-3614

Organization	Exterior Ballistics Laboratory Ballistics Research Laboratory
Technical Areas	Free-flight aerodynamics; Ballistic test range technology; Exterior ballistics; Ballistic coefficients.
Specialties	Instrumentation; High-speed photographic systems.
Papers	"Aerodynamic Data for Small Arms Projectiles," "Free-flight Aerodynamic Range," "Motion of a Projectile after Penetrating a Thin Plate."
Remarks	Contact for information concerning free-flight aerodynamics range at BRL.
Descriptors	Aerodynamics Ballistic ranges Exterior ballistics High speed photography

**Brosseau, Timothy**  
**Mechanical Engineer, Dynamics Branch**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BIL (Mr. Timothy Brosseau)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-4443**  
**Telephone: (301) 278-4443**

<b>Organization</b>	<b>Interior Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
<b>Technical Areas</b>	<b>Gas dynamics; Weapon system dynamics.</b>
<b>Specialties</b>	<b>Test instrumentation; Small caliber auto- matic weapon experimental evaluation, including test instrumentation; High cycle rate weapon dynamics (including foreign weapons); Comparative evaluation of ballistics pressure gauges.</b>
<b>Papers</b>	<b>BRL MR-2072, "Development of the Mini-hat Pressure Transducer for Use in the Extreme Environments of Small Caliber Gun Barrels", Nov. 1970.</b>
<b>Remarks</b>	<b>Particular involvement in instrumentation for experimental evaluation of small caliber weapons.</b>
<b>Descriptors</b>	<b>Foreign small arms Pressure gauges Proof test equipment Rapid fire weapons Weapon dynamics</b>

**Brunton, Loren**  
**Project Engineer, M16 Series Rifle**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: SWERR-S-PL (Mr. Loren Brunton)**  
**Rock Island, IL 61201**

**Autovon: 793-4451**  
**Telephone: (309) 794-4451**

<b>Organization</b>	<b>Light Weapons and Equipment Division</b> <b>Product Engineering Group</b> <b>Small Arms Weapons System Directorate</b> <b>Weapons Laboratory</b>
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<b>Technical Areas</b>	<b>Product Engineering</b>
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<b>Specialties</b>	<b>Configuration Management; Product Improvement; Product Refinement.</b>
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<b>Programs</b>	<b>M16 Series Rifles</b>
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<b>Remarks</b>	<b>Licensed Professional Engineer</b>
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<b>Descriptors</b>	<b>Product improvement</b>
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Butterworth, Donald S.  
Mechanical Engineer  
Special Weapons and Devices Section

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-DS (Mr. Donald S. Butterworth)  
Rock Island, IL 61201

Autovon: 793-5554  
Telephone: (309) 794-5554

Organization	Small Arms Weapon Systems Directorate Weapons Laboratory
Technical Areas	Weapon mechanisms and dynamics (including feeding and firing); Extraction and ejection systems; Ammunition/Weapon functional interface areas.
Specialties	Project engineering including: planning, coordinating, directing and evaluating research, design, development and test of weapons.
Programs	Caseless ammunition weapons
Descriptors	Caseless ammunition Weapons dynamics Weapon firing mechanisms

**Bysura, Carl J.**

**Mechanical Engineer**

**Commanding Officer**

**U. S. Army Small Arms Systems Agency**

**ATTN: AMXAA-AC (Mr. C. Bysura)**

**Aberdeen Proving Grounds, MD 21005**

**Autovon: 870-5263/5267/4637**

**Telephone: (301) 278-5263/5267/40237**

<b>Organization</b>	<b>Advanced Concepts and Technology Division</b>
<b>Technical Areas</b>	<b>Cartridge Cases; Projectiles; Propellants; Tracers.</b>
<b>Specialties</b>	<b>Manufacturing and Quality Control.</b>
<b>Programs</b>	<b>Low Light Level Sights (Promethium and Tritium) Steel Cartridge Cases (20mm MK 5 for use in MK 100 Series Ammunition); Propellants for MK 100 Series (Aircraft) Ammunition.</b>
<b>Remarks</b>	<b>Project Engineer for Small Arms Technical Information Network (SATIN) Program</b>
<b>Descriptors</b>	<b>Cartridge cases Projectiles Propellants Quality control Tracers</b>

**Cadieux, Ronald (MAJ)**  
**Chief, Vulnerability Assessments Branch**

**Commander**  
**Headquarters Armament Development and Test Center**  
**ATTN: AFATL-DLRV (MAJ. Ronald Cadieux)**  
**Eglin Air Force Base, FL 32542**

**Autovon: 872-4655**  
**Telephone: (904) 882-4655**

**Organization**

**Weapons Effects Division**  
**Air Force Armament Laboratory**

**Technical Areas**

**Terminal Effects/Vulnerability Assessment;**  
**Surface and Aerial Targets.**

**Remarks**

**Point of contact for others in the group.**

**Descriptors**

**Target vulnerability**  
**Terminal effects**  
**Weapons effects**  
**Weapon tests**



**Chait, Richard**  
**Branch Chief, Materials Property Branch**

**Director**  
**U. S. Army Materials and Mechanics Research Center**  
**ATTN: AMXMR-MP (Mr. Richard Chait)**  
**Watertown, MA 02172**

**Autovon: 684-8202**  
**Telephone: (617) 926-1900.Ext. 202**

<b>Organization</b>	<b>Materials Manufacturing and Testing Technology Division</b>
<b>Technical Areas</b>	<b>High strength steels; High strength Ti alloys; Structural armor applications.</b>
<b>Specialties</b>	<b>Flow and fracture of steels and Ti alloys; Ballistic damage of structural armor.</b>
<b>Programs</b>	<b>Utilization of advanced Ti Alloys for Heli- copter applications; Structural Behavior of Lightweight Armor; Development of Backup for Ceramic Faced Armor.</b>
<b>Papers</b>	<b>"Ballistic and Mechanical Prop. of Dual Hardness Steel Armor"; "Structural Degrad- ation of Ballistically Impacted Dual Hardness Steel"; "Factors Affecting Strength Differential of High Strength Steels".</b>
<b>Remarks</b>	<b>Registered Professional Engineer-State of Massachusetts.</b>
<b>Descriptors</b>	<b>Armor Body armor Fracture properties Stress analysis</b>

**Chaskes, Leon T.**  
**Chief, Infantry Weapons Branch**

**Commanding General**  
**Headquarters, U. S. Army Munitions Command**  
**ATTN: AMCPM-SA2 (Mr. Leon T. Chaskes)**  
**Dover, NJ 07801**

**Autovon: 880-3258/3278**  
**Telephone: (201) 328-3258/3278**

<b>Organization</b>	<b>Selected Ammunition Technical Division</b>
<b>Technical Areas</b>	<b>Small arms weapons and ammunition; Crew served weapons system; Aircraft weapons system.</b>
<b>Specialties</b>	<b>Rifle and hand arms; Grenade launcher and ammunition; Machine guns and automatic cannon.</b>
<b>Programs</b>	<b>Infantry Selected Ammunition Program; 40mm Hand and Automatic Weapons System.</b>
<b>Descriptors</b>	<b>Ammunition Grenade launchers Hand weapons Small arms</b>

**Chou, Shun-Chin (Dr.)**  
**Research-Mechanical Engineer**

**Director**  
**U. S. Army Materials and Mechanics**  
**Research Center**  
**ATTN: AMXMR-TE (Dr. Shun-Chin Chou)**  
**Watertown, MA 02172**

**Autovon: 684-8294**  
**Telephone: (617) 926-1900/4294**

<b>Organization</b>	<b>Mechanics of Materials Division</b> <b>Mechanics Research Laboratory</b>
<b>Technical Areas</b>	<b>Material properties under dynamic loading conditions; Strain-rate effect; Temperature effect; Multiaxial stress conditions.</b>
<b>Specialties</b>	<b>Experimental determination and mathematical modeling of constitutive equations of materials.</b>
<b>Programs</b>	<b>ABM Systems; Exploratory Development Small Arms Systems.</b>
<b>Papers</b>	<b>"Wave Propagation in Solids and Material Characterization "</b>
<b>Descriptors</b>	<b>Mathematical models</b> <b>Materials technology</b> <b>Pressure stress analysis</b> <b>Strain rate effects</b> <b>Temperature effects</b> <b>Thermal stress analysis</b>

**Cohut, Victor J., (MAJ GS)**  
**Commodity Manager**  
**Selected Automatic Guns and Grenade Launchers**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: AMSWE-SI-E (MAJ Victor J. Cohut)**  
**Rock Island, IL 61201**

**Autovon: 793-5649/5916**  
**Telephone: (309) 794-5649/5916**

<b>Organization</b>	<b>Special Items Management Office</b>
<b>Programs</b>	20mm, M139 Gun, Automatic; 7.62mm, M219 (M73A1) Machine Gun, Fixed; .50 Caliber Vehicle, Heavy Fixed, .50 Caliber Machine Gun; 7.62mm, M60 Series Machine Gun.
<b>Remarks</b>	The above individual should be considered a point of contact for inquiries concerning administrative status or managerial aspects of the above-listed programs. A. G. Grill is an alternate.
<b>Descriptors</b>	Machine guns

**Cole, Albert A. Jr.**  
**Chief, Light Weapons and Equipment Division**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: SWERR-S-P (Mr. Albert A. Cole, Jr.)**  
**Rock Island, IL 61201**

**Autovon: 793-4556 or 4248**  
**Telephone: (309) 794-4556 or 4248**

<b>Organization</b>	<b>Product Engineering Group</b> <b>Small Arms Weapon Systems Directorate</b> <b>Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Product Engineering</b>
<b>Specialties</b>	<b>Government Product Drawing requirements;</b> <b>Weapon configuration and identification,</b> <b>Technical Data Packages.</b>
<b>Programs</b>	<b>M203 Grenade Launcher; M16A1 Rifle;</b> <b>M14, M14A1 Rifles; World War II Arms.</b>
<b>Remarks</b>	<b>Registered Professional Engineer</b> <b>Number 19994,Massachusetts</b>
<b>Descriptors</b>	<b>Rifles</b> <b>Grenade launchers</b> <b>Product improvement</b> <b>Technical Data Packages (TDP)</b>

Conway, William F.  
Division Chief, Instrumentation Division

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-TS-J (Mr. William F. Conway)  
Dover, NJ 07801

Autovon: 880-4249  
Telephone: (201) 328-4249

Organization	Instrumentation Division Technical Support Directorate
Technical Areas	Instrumentation-Measurement and control with computer interface.
Specialties	Dynamic measurements with guns, projectiles (above 40mm), explosives and other munitions.
Programs	Measurement requirements for the research and development effort of munition development.
Remarks	Point of contact within the Instrumentation Division for test measurement of munitions at Picatinny Arsenal.
Descriptors	Test equipment Weapon dynamics

**Corrie, John D.**  
**Chief, Metals Engineering Branch**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-A1000 (Mr. John D. Corrie)**  
**Philadelphia, PA 19137**

**Autovon: 348-5424**  
**Telephone: (215) 341-5424**

<b>Technical Areas</b>	<b>Materials engineering; Physical metallurgy; Mechanical metallurgy.</b>
<b>Specialties</b>	<b>Fracture machanics; Stress corrosion; Frag- mentation mechanisms; Scanning electron microscopy; Failure analysis; Liquid metal embrittlement.</b>
<b>Programs</b>	<b>Fragmentation Materials for High Explosive Shell; Plastic Flow and Fracture of High Strength Aluminum Alloys; Stress Corrosion of High Strength Aluminum Alloys; Automatic Cannon Technology-Improved Projectile Body; X-Ray Techniques for Rapid Analysis of Small Caliber Cartridge Cases; SCAMP.</b>
<b>Papers</b>	<b>Papers on fracture, stress corrosion, liquid metal embrittlement.</b>
<b>Remarks</b>	<b>Alternate point of contact: Dr. S. K. Nash Autovon: 348/6750/7372</b>
<b>Descriptors</b>	<b>Corrosion analysis Fracture mechanics Materials technology Metallurgy</b>

**Cosgrove, Thomas E.**  
**Mechanical Engineer**

**Commanding General**  
**Headquarters US Army Materiel Command**  
**ATTN: AMCRD-JW (Mr. Thomas E. Cosgrove)**  
**Washington, DC 20315**

**Autovon: 117-5080**  
**Telephone: (202) OX 7-5080**

<b>Organization</b>	<b>Individual Weapons and Mine Warfare Branch</b> <b>Individual Soldier Division, R, D, &amp; E</b> <b>Directorate.</b>
<b>Technical Areas</b>	<b>Shoulder weapons; Hand arms; Weapons</b> <b>accessories; Mechanisms; Ammunition.</b>
<b>Specialties</b>	<b>RDT and E Program Management</b>
<b>Programs</b>	<b>Squad Automatic Weapon; Future Rifle</b> <b>System; Development of small arms;</b> <b>International Standardization.</b>
<b>Remarks</b>	<b>Principal point of contact at AMC for</b> <b>information on U.S. Army's small arms</b> <b>programs.</b>
<b>Descriptors</b>	<b>Gun auxiliary equipment</b> <b>Shoulder weapons</b>



**Crews, George**  
**Senior Project Engineer**

**Commander**  
**Headquarters Armament Development and Test Center**  
**ATTN: AFATL-DLRV (Mr. George Crews)**  
**Eglin Air Force Base, FL 32542**

**Autovon: 872-4655**  
**Telephone: (904) 882-4655**

<b>Organization</b>	<b>Vulnerability Assessments Branch</b> <b>Weapons Effects Division</b> <b>Air Force Armament Laboratory</b>
<b>Technical Areas</b>	<b>Terminal Effects/Vulnerability Assessment.</b>
<b>Programs</b>	<b>Project Thor</b>
<b>Papers</b>	<b>"Fragment Penetration"; "Impacts of AP, HE, Ball Ammunition on Target Plates".</b>
<b>Remarks</b>	<b>Point of contact for others in the group.</b>
<b>Descriptors</b>	<b>Target vulnerability</b> <b>Terminal effects</b>

**Crider, Charles L.**  
**Mechanical Engineer**

**Commanding General**  
**U.S. Army Test and Evaluation Command**  
**ATTN: AMSTE-BC (Mr. Charles L. Crider)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-3608**  
**Telephone: (301) 278-3608**

<b>Organization</b>	<b>Test and Evaluation Command</b> <b>Infantry Directorate</b>
<b>Technical Areas</b>	<b>Weapons; Mines; Rockets.</b>
<b>Specialties</b>	<b>Testing of shoulder fired rifles and machine guns; Anti-personnel mines, grenades; Shoulder fired rockets for suitability for Army use.</b>
<b>Programs</b>	<b>Product improvement tests of the above systems.</b>
<b>Descriptors</b>	<b>Antipersonnel weapons</b> <b>Grenades</b> <b>Machine guns</b> <b>Shoulder weapons</b> <b>Weapons tests</b>

**Cruze, Chalmer D.**  
**Engineering Technician**

**Commander**  
**Wright-Patterson Air Force Base**  
**ATTN: AFFDL-PTS (Mr. Chalmer D. Cruze)**  
**Dayton, OH 45433**

**Autovon: 785-5264**  
**Telephone: (513) 255-5264/6554**

<b>Organization</b>	<b>Prototype Division</b> <b>Survivability/Vulnerability Branch</b> <b>Aeronautical Systems Division</b>
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<b>Technical Areas</b>	<b>Terminal Ballistic Effects.</b>
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<b>Specialties</b>	<b>Test instrumentation; Test weapons and ammunition to satisfy a specific test program.</b>
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<b>Programs</b>	<b>Fuels; Structures; Fuel Lines and Tanks; Integral and Parasitic Armors.</b>
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<b>Descriptors</b>	<b>Ballistic tests</b> <b>Terminal ballistics</b>
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**D'Andrea, Joseph A.**  
**Mechanical Engineer**

**Commanding Officer**  
**U.S. Army Small Arms Systems Agency**  
**ATTN: AMXAA-WS (Mr. Joseph A. D'Andrea)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-4641/5267**  
**Telephone: (301) 278-4641**

**Technical Areas**

**Small arms R & D; Small arms  
ammunition R & D (up to and including  
40mm sizes)**

**Specialties**

**30mm and 40mm grenades and launchers  
including the following types of munitions:  
Antipersonnel, antimateriel, signalling,  
multiprojectile.**

**Programs**

**Future Rifle System/Grenade Launcher;  
40mm Signal Cartridge.**

**Descriptors**

**Antipersonnel ammunition  
Antimateriel ammunition  
Grenades  
Grenade launchers**

Davis, Dale M.  
Technical Director

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATI-DLD (Mr. Dale M. Davis)  
Eglin Air Force Base, FL 32542

Autovon: 872-2870/2875  
Telephone: (904) 882-2870/2875

Organization  
Guns and Rockets Division  
Air Force Armament Laboratory

Technical Areas  
Gun Design; Ammunition Design; Interior Ballistics; Exterior Ballistics; H. E. Shell Design; A. P. Shot Design; Fuze Design.

Programs  
GAU-7 25 mm; GAU -8 30mm; M61 Gun 20mm; M39 Gun 20mm; M16 Rifle; GUU-A/P (IMP)

Papers  
Numerous papers on guns, ammunition and related topics.

Remarks  
Responsible for the technical aspects of the total Air Force R and D effort in guns and ammunition including small arms.

Descriptors  
Aircraft ammunition  
Antipersonnel ammunition  
Exterior ballistics  
Fuzes  
Gun mechanisms  
High explosive ammunition  
Interior ballistics  
Weapons dynamics

**Deas, Robert**  
**Physicist, Applied Ballistics Branch**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BIL (Mr. Robert Deas)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-3180**  
**Telephone: (301) 278-3180**

<b>Organization</b>	<b>Interior Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
<b>Technical Areas</b>	<b>Interior ballistics; Heat transfer;</b> <b>Gas dynamics; Experimental</b> <b>thermodynamics</b>
<b>Specialties</b>	<b>Mathematical modeling; Computer</b> <b>simulation; Instrumentation; Pressure</b> <b>gauges; Tank guns; Accuracy of tank</b> <b>guns.</b>
<b>Programs</b>	<b>Heat transfer effects of additives;</b> <b>Pressure gradients in high-velocity</b> <b>guns; Interior ballistic calculations,</b> <b>saboted projectiles; Variable bias in</b> <b>tank guns.</b>
<b>Papers</b>	<b>"Pressure Measurements: Caliber 5.6mm</b> <b>Cartridge, " "Installation of the IBL Min-</b> <b>iature Pressure Gage in the Firing Probe</b> <b>of the 152mm Gun"</b>
<b>Remarks</b>	<b>Contact Mr. Frankle, Branch Chief,</b> <b>as an alternate.</b>
<b>Descriptors</b>	<b>Computer simulation</b> <b>Gas dynamics</b> <b>Interior ballistics</b> <b>Mathematical models</b> <b>Pressure gauges</b> <b>Thermodynamics</b>

DeCaprio, Louis  
Supervisory Mechanical Engineer, Unit Chief

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-AD-D-W-4 (Mr. Louis DeCaprio)  
Dover, NJ 07801

Autovon: 880-4907/2415  
Telephone: (201) 328-4907/2415

Organization	Development Section IIIB Warheads and Special Projects Branch Ammo Development Division Ammo Development and Engineering Directorate
Technical Areas	Design, test and evaluation of development area target munitions for hand held and automatic grenade launcher weapon systems.
Specialties	Development of high explosive fragmentation and canister antipersonnel cartridges; Light- or smoke-emitting pyrotechnic signaling. Illuminating cartridges and practice cartridges yielding impact signature.
Programs	30mm and 40mm high-explosive, dual-purpose canister pyrotechnic and practice cartridges for the M79, M203, XM174 and Future Rifle System grenade.
Papers	Papers on area target munition for hand-held grenade launchers.
Remarks	Cost estimator for AMC. Mr. R. C. Smith-alternate contact at Picatinny Arsenal.
Descriptors	Antipersonnel ammunition Grenades High explosive ammunition Pyrotechnics

DiBenedetto, Joseph  
Research Metallurgist  
Metallic Materials Group

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-R (Mr. Joseph DiBenedetto)  
Rock Island, IL 61201

Autovon: 793-4627/5363  
Telephone: (309) 794-4627/5363

**Organization**

Small Arms Weapon Systems Directorate  
Weapons Laboratory

**Technical Areas**

Metallic material science.

**Specialties**

Steel powder metallurgy; Process  
metallurgy.

**Programs**

Future Weapons Systems.

**Papers**

Papers on: Metal powder forging; Materials  
for rapid-fire gun barrels; Fabrication of  
improved gun barrel materials.

**Descriptors**

Gun barrel materials  
Metallurgy  
Powder metallurgy



Dickey, Charles M.  
Chief, Ballistics and Analytics Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7200 (Mr. Charles M. Dickey)  
Philadelphia, PA 19137

Autovon: 348-5521  
Telephone: (215) 831-5521

**Organization**

Munitions Development and Engineering  
Directorate

**Technical Areas**

Interior ballistics; Exterior ballistics;  
Transitional ballistics; Terminal ballistics;  
Systems analysis; Systems synthesis;  
Physical optics; Operations research;  
CAD-E; Tactical packaging; Propellants.

**Specialties**

Duplex ammunition; Caseless ammunition;  
Flechettes; Sabots; Drag reduction; Low noise  
systems; Test instrumentation; Simulation;  
Frangible projectiles; Hypervelocity; Math  
modeling; Wound ballistics; Effectiveness;  
Low lethality systems; Feasibility studies;  
Closed bomb studies; Recoilless systems.

**Programs**

SALVO; Small Arms Ammo Technology;  
Cartridge Case Extraction; Flechette Dispersion;  
Diagnostic Center for Small Arms Weapon  
System; Plastic Cased Ammunition; Engineering  
Design Handbook - Small Arms System;  
Automatic Cannon Technology (ACT, formerly  
DESVAL); Hypervelocity acceleration;

**Papers**

Numerous papers on closed bomb studies of  
propellants; "Caliber .50 Interior Ballistics";  
"Kerr Electro-Optical System for Cal. .50  
Displacement-Time Measurements"; "Study  
of Quartz Piezoelectric Gage for Pressure  
Measurements."

**Dickey, Charles M.**

**Chief, Ballistics and Analytics Branch (con't.)**

**Remarks**

Alternate Contacts: R. McHugh, S. Kueson,  
F. Malinosk. Data bank on small arms  
ammunition under development (tables of  
characteristics).

**Descriptors**

Ammunition  
Ballistics  
Caseless ammunition  
Exterior ballistics  
Flechettes  
Frangible ammunition  
Interior ballistics  
Mathematical models  
Packaging  
Plastic cased ammunition  
Propellants  
Terminal ballistics  
Transition ballistics  
Wound ballistics

**Mechanical Engineer, Process Development Division**

**Director**

**U. S. Army Materials and Mechanics Research Center**

**ATTN: AMXMR-ER (Mr. Stephen J. Doherty)**

**Watertown, MA 02172**

**Autovon: 684-8279/8219**

**Telephone: (617) 916-1900 Ext. 279 or 219**

<b>Organization</b>	<b>Materials Development Laboratory</b>
<b>Technical Areas</b>	<b>Sabot technology; Projectile design and materials; Terminal ballistic behavior of small arms projectiles; Rotating band and projectile jackets materials and designs.</b>
<b>Specialties</b>	<b>Sabot technology; Projectile materials; Flechettes-terminal ballistics; Projectile accuracy-terminal ballistics.</b>
<b>Programs</b>	<b>Materials for Improved Kinetic Energy Ammunition; Special Purpose Individual Weapon (SPIW)</b>
<b>Papers</b>	<b>"A New Concept in Lightweight Armor Penetrators - Dual Hardness Projectiles" (Army science conference paper); "Sabot Materials and Designs for High Velocity Kinetic Energy Ammunition", AMRATR 67-11; The Probable Accuracy of Small Arms Projectiles When Fired at Obscured Targets (Conditions of Simulated Rain-fall)", AMRA 64-07.</b>
<b>Remarks</b>	<b>Registered Professional Engineer-Massachusetts No. 26152; Projectile patent, Department of Army - AMC No. 5049</b>
<b>Descriptors</b>	<b>Armor piercing ammunition Flechettes Materials technology Penetrators Projectiles Rotating bands Sabots Terminal ballistics</b>

**Donahue, James**  
**Branch Chief, Ammunition Ballistic Range Branch**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-K3100 (Mr. James A. Donahue)**  
**Philadelphia, PA 19137**

**Autovon: 348-5845/5661**  
**Telephone: (215) 831-5845/5661**

<b>Organization</b>	<b>Technical Support Directorate</b> <b>Test and Evaluation Division</b>
<b>Technical Areas</b>	<b>Ballistics: (interior, transition,</b> <b>exterior, terminal); Test and evaluation.</b>
<b>Specialties</b>	<b>Test procedures and instrumentation;</b> <b>Automated data collection.</b>
<b>Programs</b>	<b>Automated Range Management System (ARMS);</b> <b>Automatic Target Scoring System.</b>
<b>Papers</b>	<b>"Automatic Data Acquisition for Ballistic</b> <b>Testing. "</b>
<b>Descriptors</b>	<b>Acceptance tests</b> <b>Ballistic tests</b> <b>Exterior ballistics</b> <b>Interior ballistics</b> <b>Proof tests</b> <b>Terminal ballistics</b> <b>Test equipment</b> <b>Transition ballistics</b>

Donnelly, Emmet F.  
LTC OrdC AUS (Ret.)  
Engineering Technician

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BRL (Mr. Emmet F. Donnelly)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-4140  
Telephone: (301) 278-4140

**Organization**

Ballistics Research Laboratory

**Technical Areas**

Firing range operation; Small arms rebuild operations; Chronograph use and operation; Reloading; Vulnerability testing of materials; Identification of fired projectiles; Marksman-ship instruction.

**Specialties**

Identification of fired small arms projectiles, including C. E. M. material. Use of smoothbore test cannon to obtain extremely high velocities. Use of various techniques to fire all sorts of odd-shaped projectiles at varying velocities. Use of all types of foreign, especially C. E. M. weapons and ammunition, including loading, altering, and reloading the latter.

**Programs**

Vulnerability testing of aircraft and vehicular components: woods, plywoods, glass, aluminum, steel, boron, ceramics, etc. Identification of small arms projectiles emanating from the recent Wound Ballistics Program.

**Papers**

B. R. L. Report No. 1365 on "Bullet Identification" Forensic Science Journal Report on "Retention of Bullets in Spleen, Orbit, etc.", "The latter written jointly with Col. (Dr.) Pierre Finck. Other articles published in issues of The Gun Digest, American Rifleman, and Guns Magazine. Article in Guns ("Thoughts On The Ideal Battle Rifle") now pending.

(cont'd)

Donnelly, Emmet F.  
LTC OrdC AUS (Ret.)  
Engineering Technician

**Remarks**

Firearms consultant. Holds various awards for rifle and pistol marksmanship. Antique arms collector. Alternate contacts: Nelson H. McCall 278-4248, Timothy L. Brosseau 278-4443.

**Descriptors**

Projectiles  
Velocity tests  
Vulnerability  
Wound ballistics

**Dorbeck, Richard J.**  
**Equipment Specialist (Ordnance)**

**Commanding General**  
**Headquarter, U. S. Army Weapons Command**  
**ATTN: AMSWE-MAA-S (Mr. Richard J. Dorbeck)**  
**Rock Island, IL 61201**

**Autovon: 793-6496/4687**  
**Telephone: (309) 794-6496/4687**

<b>Organization</b>	<b>Maintenance Directorate</b>
<b>Technical Areas</b>	<b>Maintenance engineering; Maintenance management; Technical publications; Computer programming; Demilitarization.</b>
<b>Specialties</b>	<b>Maintainability in design, analysis and prediction; Development of maintenance and logistic support concepts and plans; Technical assistance to field (CONUS and OCONUS) and depots; Troubleshooting equipment failures; Development of special tools; Authorization and levels of repair.</b>
<b>Programs</b>	<b>All small arms weapons up to and including 20mm; Aircraft-peculiar types of weapons; Small arms and training devices; Depot coordination (overhaul of small arms weapons).</b>
<b>Papers</b>	<b>Technical papers written on all aspects of weapons maintenance (small arms) relative to maintainability, logistics, depot support, field problems, manpower support requirements. Prepared "Study to Determine the Logistical Advantages of a Small Arms Weapons System with a Commonality of Parts Between Rifles and Machine Guns."</b>
<b>Remarks</b>	<b>A broad knowledge of all small arms weapons in the area of maintainability. Primary interest in all hand and shoulder fired weapons in the small arms group (rifles, pistols, revolvers, shotguns, etc.). General familiarity with all automatic weapons (machine guns and automatic cannons).</b>

**Dorbeck, Richard J. . (cont.)**

**Descriptors**

**Field maintenance**

**Logistics**

**Maintainability**

**Shop maintenance**



**Doris, Thomas A. Jr.**  
**Chemical Engineer**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-J8200-150-2 (Mr. Thomas A. Doris Jr.)**  
**Philadelphia, PA 19137**

**Autovon: 348-6446**  
**Telephone: (215) 831-6446**

<b>Organization</b>	<b>Pyrotechnic Development Branch</b> <b>Munitions Development and Engineering</b> <b>Directorate</b>
<b>Technical Areas</b>	<b>Pyrotechnics</b>
<b>Specialties</b>	<b>Pyrotechnic mixtures for small arms</b> <b>ammunition from flechettes to 20mm.</b>
<b>Programs</b>	<b>VADS; SAWS; Dimtracer; Flechette</b> <b>Tracer.</b>
<b>Papers</b>	<b>Presentations at AOA Meetings, Franklin</b> <b>Institute Symposium, and Frankford Arsenal</b> <b>Reports on Tracer Development and</b> <b>Pyrotechnics.</b>
<b>Remarks</b>	<b>Several patents on tracer mixtures,</b> <b>projectile designs, igniters.</b>
<b>Descriptors</b>	<b>Ammunition</b> <b>Pyrotechnics</b> <b>Tracers</b>

Duncan, Robert E.  
Team Leader, Grenade Launcher  
Mechanical Engineer

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-DI (Mr. Robert E. Duncan)  
Rock Island, IL 61201

Autovon: 793-4661  
Telephone: (309) 794-4661

Organization	Small Arms Systems Directorate Weapons Laboratory
Technical Areas	R and D programs; Interior ballistics; Exterior ballistics; Terminal ballistics; Machine design; Weapon dynamics.
Specialties	Grenade launcher mechanisms; Grenade launcher sights; Firing pin energy theories; Stress analysis; Material selection; Fracture mechanics; Combat simulation math model- ing; Fabrication techniques; Testing pro- cedures.
Programs	Future Rifle System; Exploratory Development of Grenade Launchers.
Papers	"Concepts of Single Shot Grenade Launchers" attached to an Infantry Rifle", June 1971. Technical Note, "Barrel Latch Force Analysis for the M203, 40mm Grenade Launcher", Sep. 1970.
Remarks	Alternate Contact: Mr. George E. Cooksey; SWERR-S-DI, Ext. 4510.
Descriptors	Exterior ballistics Firing pins Fracture properties Grenade launchers Interior ballistics Mathematical models Stress analysis Terminal ballistics Weapon tests

**Ebihara, William T. (Dr.)**  
**Research Metallurgist**  
**Materials Science and Technology Division**

**Commanding General**  
**Headquarters U.S. Army Weapons Command**  
**ATTN: SWERR-R (Dr. William T. Ebihara)**  
**Rock Island, IL 61201**

**Autovon: 793-4480**  
**Telephone: (309) 794-4480**

<b>Organization</b>	<b>Research Directorate</b> <b>Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Material science; Physical metallurgy.</b>
<b>Specialties</b>	<b>Gas-metal reaction; mechanical and gas erosion analysis.</b>
<b>Programs</b>	<b>Gun Barrel Technology (A607) (Investigation of Erosion in Gun Barrels); Metals Research for Army Materiel (Study of Embrittlement in Refractory Alloys)</b>
<b>Papers</b>	<b>"Structural Stability of a Cast Co-Cr-Mo Alloy During Impulsive Thermal-Mechanical Loading" (TMS Paper S70-2); "Ionitrification Kinetics of Two Commercial Steels" (TMS Paper A70-61); "In-Process Metallurgy of Wrought Cobalt Base Alloy" (Cobalt, March 1969); "The Tungsten- Oxygen System" (Trans. AIME).</b>
<b>Descriptors</b>	<b>Erosion</b> <b>Materials technology</b> <b>Metallurgy</b>

**Eig, Merrill**  
**Chief, Materials Selection Section**  
**Materials Application Branch**

**Commanding Officer**  
**Picatinny Arsenal**  
**ATTN: SMUPA-FR-M-MA (Mr. Merrill Eig)**  
**Dover, NJ 07801**

**Autovon: 880-3098**  
**Telephone: (201) 328-3098**

<b>Organization</b>	<b>Materials Engineering Div.</b> <b>Feltman Research Laboratory</b>
<b>Technical Areas</b>	<b>Materials selection, design, test and evaluation.</b>
<b>Specialties</b>	<b>Selection and design of non metallic materials for cartridge cases and various ammunition components; Obturator material technology; Rotating band material selection and performance characteristics; Structural materials (glass reinforced) for projectile bodies, gun tubes and components.</b>
<b>Programs</b>	<b>Organic Materials Technology: Rotating bands, gun tubes and launchers, obturators.</b>
<b>Papers</b>	<b>Reports on use of filament winding technology in the design and manufacture of high-performance gun tubes.</b>
<b>Remarks</b>	<b>Several patents relating to use of test equipment and novel concepts using glass-reinforced plastic materials in gun tubes and ammunition.</b>
<b>Descriptors</b>	<b>Gun barrels</b> <b>Materials technology</b> <b>Rotating bands</b>

**Fagg, Charles R.**  
**Mechanical Engineer**

**Commanding General**  
**Headquarters U.S. Army Weapons Command**  
**ATTN: SWERR-S-DS (Mr. Charles Fagg)**  
**Rock Island, IL 61201**

**Autovon: 793-6674/4354**  
**Telephone: (309) 794-6674/4354**

<b>Organization</b>	<b>Small Arms Weapons Systems Directorate Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Weapon dynamics</b>
<b>Specialties</b>	<b>Mechanism design and development; Competitive shooting; Weapon/ammunition interface.</b>
<b>Programs</b>	<b>M16A1 Rifle; XM19 Rifle; Aluminum Case Firing Fixture; Low Maintenance Material Rifle.</b>
<b>Papers</b>	<b>Small Arms Weapon Systems Directorate, Technical Note No. SWERR-S7-72 "Alum- inum Cartridge Case Firing Fixture Invest- igations".</b>
<b>Descriptors</b>	<b>Weapon dynamics</b>

**Fallin, Herbert (Dr.)**  
**Chief, Small Arms Section**

**Commanding Officer**  
**Army Materiel Systems Analysis Agency**  
**ATTN: AMXSU-GI (Dr. Herbert Fallin)**  
**Aberdeen Proving Ground, MD 21005**

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**Telephone: (301) 278-3472**

<b>Organization</b>	<b>Infantry Weapons Analysis Branch</b>
<b>Technical Areas</b>	<b>Weapons systems effectiveness models</b>
<b>Specialties</b>	<b>Effectiveness models</b>
<b>Papers</b>	<b>"Analysis of Machine Gun Burst Dispersion Data with Corresponding Effectiveness Model, " "A Limited Hit Capability With Several Vehicle Rapid Fire Weapon System (VRFWS) Candidates"</b>
<b>Remarks</b>	<b>The Small Arms Section has a pilot Small Arms Data Bank, consisting of published reports (Kodak Miracode System). System is not fully operational at present. Dr. Fallin is point of contact for further information.</b>
<b>Descriptors</b>	<b>Mathematical models Physical simulation Weapon effects Weapons systems</b>

**Ferrett, Charles S. (Jr.)**  
**Mechanical Engineer**

**Commanding Officer**  
**U. S. Army Small Arms Systems Agency**  
**ATTN: AMXAA-WS (Mr. Charles S. Ferrett)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-4641/5267**  
**Telephone: (301) 278-4641/5267**

<b>Organization</b>	<b>Weapon Systems Synthesis Division</b>
<b>Technical Areas</b>	<b>Program management.</b>
<b>Programs</b>	<b>Machine gun systems; Machine gun mounts; SAW; General Purpose Armor Machine Gun.</b>
<b>Descriptors</b>	<b>Machine guns Weapon mounts</b>

**Flatau, Abraham**  
**Chief, Aerodynamics Branch**

**Commanding Officer**  
**Chemical Laboratory**  
**ATTN: SMUEA-CL-PA (Mr. Abraham Flatau)**  
**Edgewood Arsenal, MD. 21010**

**Autovon: 584-3055/2158**  
**Telephone: (301) 671-3055/2158**

<b>Organization</b>	<b>Physical Research Division</b> <b>Chemical Laboratory</b>
<b>Technical Areas</b>	<b>Aerodynamics; Free flight retard-</b> <b>ation devices; Projectile aerodynamics.</b>
<b>Specialities</b>	<b>Dispersion of submunitions; Wind tunnel</b> <b>investigations; Aeroballistic studies;</b> <b>Computer trajectory simulation (math-</b> <b>modeling).</b>
<b>Programs</b>	<b>Ring Airfoil Grenade; Extended Range</b> <b>Ammunition; Parametric investigation,</b> <b>of projectiles.</b>
<b>Papers</b>	<b>Numerous papers in submunitions and</b> <b>aerodynamics.</b>
<b>Remarks</b>	<b>Contact for information on wind tunnel</b> <b>facility-capability from Mach. 0.1 to</b> <b>Mach 3.7.</b>
<b>Descriptors</b>	<b>Aerodynamics</b> <b>Computer simulation</b> <b>Exterior ballistics</b> <b>Grenades</b> <b>Mathematical models</b>



Flint, James  
Senior Project Engineer

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLRV (Mr. James Flint)  
Eglin Air Force Base, FL 32542

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Telephone: (904) 882-4655

Organization	Vulnerability Assessments Branch Weapons Effects Division
Technical Areas	Terminal Effects
Specialties	Mathematical modeling; Computer simulation; "Behind-the armor" effectiveness.
Programs	GAU-8 support; 40mm effectiveness studies; 20mm (Tri-service)
Papers	Effectiveness of 20, 30, 40mm ammunition.
Remarks	Developer of the SHOTGEN, point burst vulnerability assessment techniques.
Descriptors	Computer simulation Mathematical models Terminal effects Vulnerability Weapons effects

**Fulton, Charles L.**  
**Chief, Test and Evaluation Division**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-K3000 (Mr. Charles L. Fulton)**  
**Philadelphia, PA 19137**

**Autovon: 348-6715/6406**  
**Telephone: (215) 831-6715/6406**

<b>Organization</b>	<b>Technical Support Divectorate</b>
<b>Technical Areas</b>	<b>Interior, exterior and terminal ballistics; Ballistic range operations.</b>
<b>Specialties</b>	<b>Testing of ordnance items; Instrumentation, Methods and experiment design; Small Caliber Ammunition (SCA); Improvised explosives and demolitions; Propellant Act- uated Devices (PAD); Guerrilla and counter guerrilla warfare; Special and unique weapon systems.</b>
<b>Papers</b>	<b>FA Technical Reports on various PAD and SCA items.</b>
<b>Remarks</b>	<b>Point of contact for all matters relating to test and evaluation of SCA and PAD at Frankford Arsenal.</b>
<b>Descriptors</b>	<b>Acceptance tests Ballistics tests Exterior ballistics Interior ballistics Proof tests Terminal ballistics Test ranges</b>

**Garbarini, John**  
**Equipment Specialist (Armament)**

**Commander**  
**U.S. Army Combat Developments Command**  
**ATTN: Mr. John Garbarini**  
**Fort Rucker, AL 36360**

**Autovon: 558-2704**  
**Telephone: (205) 255-2704**

<b>Technical Areas</b>	<b>Aircraft armament; Fire control; Missile systems.</b>
<b>Specialties</b>	<b>Weapon systems development to include tactics of employment.</b>
<b>Programs</b>	<b>Helicopter Weapons Systems</b>
<b>Descriptors</b>	<b>Aircraft armaments</b> <b>Fire control components</b> <b>Fire control systems</b>

**Gay, Herman Paul**  
**Chief Engineer, Interior, Ballistics Laboratory**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BIL (Mr. Herman P. Gay)**  
**Aberdeen Proving Ground, MD 21005**

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**Telephone: (301) 278-3083**

<b>Organization</b>	<b>Interior Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
<b>Technical Areas</b>	<b>Small arms weapons; Mounts;</b> <b>Accessories.</b>
<b>Specialties</b>	<b>Dynamics, Kinematics of weapons</b> <b>and mounts; Analog simulation;</b> <b>Instrumentation.</b>
<b>Programs</b>	<b>Special Purpose Infantry Weapon (SPIW);</b> <b>Variable Rate of Fire Weapons System.</b>
<b>Papers</b>	<b>Numerous BRL Publications in above</b> <b>areas.</b>
<b>Descriptors</b>	<b>Computer simulation</b> <b>Gun auxiliary equipment</b> <b>Interior ballistics</b> <b>Weapon mounts</b>

**Geene, Robert**  
**Physicist, Applied Ballistics Laboratory**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BIL (Mr. Robert Geene)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-3574**  
**Telephone: (301) 278-3574**

<b>Organization</b>	<b>Interior Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
<b>Technical Areas</b>	<b>Interior ballistics; Thermodynamics;</b> <b>Rockets.</b>
<b>Specialties</b>	<b>Mathematical models; Computer simulation;</b> <b>Interior ballistics testing.</b>
<b>Programs</b>	<b>Recoilless Rifles.</b>
<b>Papers</b>	<b>Papers on small arms propellants,</b> <b>pyrotechnics, interior ballistics.</b>
<b>Remarks</b>	<b>Contact Mr. Frankle, Branch Chief,</b> <b>as an alternate.</b>
<b>Descriptors</b>	<b>Computer simulation</b> <b>Interior ballistics</b> <b>Mathematical models</b> <b>Recoilless rifles</b> <b>Rockets</b> <b>Therodynamics</b>

**Gerber, Nathan**  
**Aerospace Research Engineer, Fluid Dynamics Group**

**Director**  
**Aberdeen Research and Development Center**  
**ATTN: AMXRD-BEL (Mr. Nathan Gerber)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-2914**  
**Telephone: (301) 278-2914**

<b>Organization</b>	<b>Exterior Ballistics Laboratory</b> <b>Ballistics Research Laboratory</b>
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<b>Technical Areas</b>	<b>Gas dynamics, mathematical models.</b>
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<b>Specialties</b>	<b>Rifle gas systems.</b>
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<b>Descriptors</b>	<b>Gas dynamics</b> <b>Gas operated guns</b> <b>Mathematical models</b>
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Gericke, Otto R.  
Branch Chief, Nondestructive Test Development Branch

Director  
U. S. Army Materials and Mechanics Research Center  
ATTN: AMXMR-MN (Mr. Otto R. Gericke)  
Watertown, MA. 02172

Autovon: 684-8440  
Telephone: (617) 926-1900, Ext. 440

Technical Areas                      Nondestructive testing, including:  
Radiography, ultrasonics, infrared,  
magnetics, microwaves and holography.

Specialties                              Ultrasonic spectroscopy

Programs                                Development of novel nondestructive  
testing methods; Development of nondest-  
ructive tests for composite materials;  
Development of nondestructive procedures  
for materials testing technology.

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Papers                                    "Theory and NDT Applications of Ultrasonic  
Pulse-Echo Spectroscopy" in Symposium on  
the Future of Ultrasonic Spectroscopy (P.  
Reynolds, Editor), BNFR, London, 1970;  
"Ultrasonic Spectroscopy", in Research Tech-  
niques in Nondestructive Testing (R. S. Sharpe,  
Editor), Academic Press, London 1970.

Remarks                                Alternate contacts: Mr. H. P. Hatch,  
Mr. P. C. McEleney

Descriptors                              Materials technology  
Nondestructive testing

Gibson, Wilmot  
Chief, Heavy Weapons and Equipment Division

Commanding General  
Headquarters U.S. Army Weapons Command  
ATTN: SWERR-S-P (Mr. Wilmot Gibson)  
Rock Island, IL 61201

Autovon: 793-4667/4521  
Telephone: (309) 794-4667/4521

Organization	Product Engineering Group Small Arms Weapons Systems Directorate Weapons Laboratory
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Technical Areas	Product Engineering
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Specialties	Configuration management; Technical data preparation.
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Programs	M60 Series Machine Guns, 7.62mm; M85 Machine Gun, Cal. .50; M73A1/ M219 Machine Gun, 7.62mm; M8C Spotting Rifle, Cal. .50; Browning Machine Guns, Cal. .30 and Cal. .50.
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Descriptors	Product improvement Technical Data Packages (TDP)
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Gilhooly, Francis  
Product Engineer

Commanding General  
Headquarters U.S. Army Weapons Command  
ATTN: SWEER-S-P (Mr. Francis Gilhooly)  
Rock Island, IL 61201

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Telephone: (309) 794-4681/4521

Organization	Product Engineering Group Small Arms Weapon Systems Directorate Weapons Laboratory
Technical Areas	Product engineering
Specialties	Configuration management; Technical Data Preparation.
Programs	M60 Series Machine Guns, 7.62mm; M8C Spotting Rifle, Cal. .50 (With related accessories, i.e., mounts, links, etc.)
Descriptors	Product improvement Technical Data Packages (TDP)

Gisser, Henry (Dr.)  
Chief, Chemistry Research Division

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L6000 (Dr. Henry Gisser)  
Philadelphia, PA 19137

Autovon: 348-6102/6577  
Telephone: (215) 831-6102/6577

Organization	Pitman-Dunn Laboratory
Technical Areas	Physical chemistry; Auto-oxidation; Polymer chemistry; Surface chemistry.
Specialties	Friction and wear; Lubricant additives; Polymer chemistry; Surface chemistry; Corrosion preventive additives.
Programs	Army research projects on lubricants, friction and wear; Power transmission fluids; Corrosion preventive compounds; Research in chemistry; Research in materials.
Papers	Papers on polymers, lubricants, friction and wear, fluorine compounds, lubricant additives, autoxidation.
Remarks	Many patents in areas above. Adjunct Associate Professor of Chemistry, Temple University, 1967-69. May act as point of contact for Chemistry Research Division, Pitman-Dunn Laboratory, Frankford Arsenal.
Descriptors	Friction wear Lubricants

Goldstein, Sidney  
Physicist

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7200 (Mr. Sidney Goldstein)  
Philadelphia, PA 19137

Autovon: 8-348-5932  
Telephone: (215) 831-5932

Organization	Munitions Development and Engineering Directorate.
Technical Areas	Interior ballistics, weapon dynamics.
Specialties	Mathematical modeling of gas transmission systems; Method of characteristics.
Programs	M16A1 Rifle, Serial Flechette Rifle.
Paper	"Model for the Gas Transmission System of the M16A1 Rifle", Frankford Arsenal Tech. Note, to be published.
Descriptors	Interior ballistics Mathematical models Weapon dynamics

**Gooch, William A.**  
**Materials Engineer**

**Commanding Officer**  
**U. S. Army Foreign Science and Technology Center**  
**ATTN: AMXST (Mr. William A. Gooch)**  
**Charlottesville, VA 22902**

**Autovon: 2747-471**  
**Telephone: (703) 296-5171 Ext. 471**

<b>Organization</b>	<b>Army Foreign Science and Technology Center</b>
<b>Technical Areas</b>	<b>Materials. (f oreign); Penetrators.</b>
<b>Specialties</b>	<b>Armor materials; Heavy metal penetrators.</b>
<b>Programs</b>	<b>Investigation of foreign developments.</b>
<b>Descriptors</b>	<b>Materials technology</b> <b>Penetrators</b>

**Grace, Harley**  
**Commodity Management Specialist**

**Commanding General**  
**Headquarters U.S. Army Weapons Command**  
**ATTN: AMSWE-SI-H (Mr. Harley Grace)**  
**Rock Island, IL 61201**

**Autovon: 793-5749**  
**Telephone: (309) 794-5749**

<b>Organization</b>	<b>Office, Commodity Manager, Rifles</b> <b>Special Items Management Office</b>
<b>Programs</b>	<b>Manager for M16 rifles; M16A1 rifles;</b> <b>.M203 grenade launcher and support items.</b>
<b>Remarks</b>	<b>Serves as contact point for areas indicated</b> <b>above.</b>
<b>Descriptors</b>	<b>Grenade launcher rifles</b>

Grollman, Bertram  
Physical Scientist, Dynamics Branch

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BIL (Mr. Bertram Grollman)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-2411  
Telephone: (301) 278-2411

Organization	Interior Ballistics Laboratory Ballistics Research Laboratory
Technical Areas	Interior ballistics; Blank fire ammunition.
Programs	Optimum Projectile Program.
Papers	Co-author of "Compendium of Ballistic Properties of Projectiles of Possible Interest in Small Arms", BRL R1532
Descriptors	Blank cartridges Interior ballistics

Gruner, Frederick  
General Engineer

Commanding Officer  
US Army Small Arms Systems Agency  
ATTN: AMXAA-AC, Bldg. 314 (Mr. F. Gruner)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5163/4637  
Telephone: (301) 278-5263

Organization	Advanced Concepts and Technology Division
Technical Areas	Mechanical engineering; Product development; Mechanical metallurgy; Dynamic strength of materials; Applied mechanics.
Specialties	Program management; Barrel technology; Materials for small arms components; Use of super alloys in gun design; Aluminum and steel light weight cartridge design.
Programs	XM-140 30mm aircraft cannon; Squad Automatic Weapon (SAW); Future Rifle System (FRS); M16A1 Rifle.
Papers	Cooling study for XM140 Gun Barrel, USA WECOM 68-1127; "A High Performance Automatic Aircraft Cannon Barrel," USA WECOM Research and Engineering Directorate Dec. '69; "M16A1 Rifle-Rifle Performance with Increased Belt Carrier Mass", USA WECOM R & E Directorate 69-120; "M139 M.G. Barrel Salvaging Program", Aug. '69. USA WECOM Tech. Note 70-102.
Remarks	Point of contact, coordinator, program manager for: Light weight cartridge case; Barrel technology; Lubrication technology; Light weight high strength materials. Licensed Professional Engineer (Wisconsin).
Descriptors	Lubrication Materials technology

**Gulick, Leonard**  
**Head, Aircraft Gun Systems Branch**

**Commander**  
**Naval Weapons Center**  
**ATTN: CODE 3015 (Mr. Leonard Gulick)**  
**China Lake, CA 93555**

**Autovon: 898-1700 Ext. 2505/2067**  
**Telephone: (714) 939-2505/2067**

<b>Technical Areas</b>	<b>Development of aircraft gun systems.</b>
<b>Programs</b>	<b>20mm Lightweight Gun Pod; 25mm Liquid Propellant Gun System; 20mm General Purpose Projectile; M197 Gun.</b>
<b>Remarks</b>	<b>Source of information on Navy aircraft gun systems developments.</b>
<b>Descriptors</b>	<b>Aircraft armaments</b>



Hammer, Alexander (Dr.)  
Director, Research Directorate

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-R (Dr. Alexander Hammer)  
Rock Island, IL 61201

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Telephone: (309) 794-5581 or 5726

Organization	Weapons Laboratory
Technical Areas	Small arms weapon technology; weapons dynamics; kinematics; analytical design; barrel technology; stress analysis; barrel, link and component design; rifling.
Specialties	Mount-weapon interaction studies, simulation.
Programs	Gun barrel technology.
Papers	"Gun Tubes", AMCP 706-252; "Engineering Design, Guns Series", February, 1964; "Gun Barrel Technology at Weapons Laboratory, Rock Island 1968-1971".
Remarks	Fellow, American Society of Mechanical Engineers. Professional Engineer, State of Massachusetts. Lecturer at Universities of Massachusetts, New Hampshire, Iowa, Purdue, MIT, U. S. Military Academy, West Point, etc.
Descriptors	Gun barrels Physical simulation Rifles Stress analysis Weapon dynamics Weapon mounts

Hayner, Michael  
Mechanical Engineer, Munitions Applications Branch

Commanding Officer  
Development and Engineering Directorate  
ATTN: SMUEA-DE-MM (Mr. Michael Hayner)  
Edgewood Arsenal, MD 21010

Autovon: 584-2297  
Telephone: (301) 671-2297

Organization	Munition Systems Division Development and Engineering Directorate
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Technical Areas	Exterior ballistics; Chemical ammunition; Dissemination technology.
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Programs	Telecartridge program (40mm); CS Munitions.
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Descriptors	Chemical ammunition Dissemination technology Exterior ballistics
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Heiney, Otto K.  
Group Leader  
Interior Ballistics and Propellant Group

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DL DL(Mr. Otto K. Heiney)  
Eglin Air Force Base, FL 32542

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Telephone: (904) 882-2020/4278

Organization	Guns and Rockets Division Air Force Armament Laboratory
Technical Areas	Gun ammunition design and test; Advanced propellant development; Interior ballistic analysis; Interior ballistic experimentation.
Specialties	Mathematical modeling of the interior ballistic process; Theoretical thermochemistry of advanced gun propellants; Interior ballistic digital data acquisition.
Programs	Hypervelocity aircraft cannon development; High impetus low flame temperature, low weight propellant; Aluminum cartridge case; Plastic rotating band development.
Papers	Interior ballistics; Advanced propellants; Propellant thermochemistry.
Remarks	Contact for information on AFATL'S computerized interior ballistics testing facility.
Descriptors	Interior ballistics Mathematical models Proof test data Propellant chemistry Test equipment

Henry, Robert S.  
Mechanical Engineer

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-P (Mr. Robert S. Henry)  
Rock Island, IL 61201

Autovon: 793-4248  
Telephone: (309) 794-4248

Organization	Product Engineering Group Small Arms Weapons Directorate Weapons Laboratory
Technical Areas	Product engineering; Production engineering; Value engineering; Design; Ballistics; Reliability; Maintainability engineering.
Specialties	Product engineering; Production engineering.
Program	M73/M219 Machine Gun; M60 Machine Gun; M8C Spotting Rifle; M85 Machine Gun; M16A1 Rifle; M203 Grenade Launcher.
Remarks	Registered Professional Engineer (Massachusetts) Alternate contact: Albert A. Cole
Descriptors	Maintainability Product improvement Reliability Value engineering Weapons fabrication

Herr, Louis  
Mathematician, Solid Mechanics Branch

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BT (Mr. Louis Herr)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-3304  
Telephone: (301) 278-3304

Organization	Penetration Section Terminal Ballistics Laboratory Ballistics Research Laboratory
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Technical Areas	Terminal ballistics
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Specialties	X ray instrumentation; Radiography; Terminal effects in dense media; Penetration studies.
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Programs	Unusual Bullet Study.
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Papers	With L. Grabarek: "Terminal Ballistic Evaluation of XM 144 Flechette, the 5.56 mm M 193 Ball Bullet and the 7.62 mm, M80 Ball Bullet (U)", Aug. 1965, BRL TN 1582; "Performance of Small Arms Pro- jectiles Against Various Targets at Cal- culated Ranges of 600 to 1000 Meters (U)", April 1966, BRL TN 1611.
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Remarks	Mr. L. Grabarek or A. J. Ricchazzi may be contacted as alternates (same extension).
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Descriptors	Instrumentation Penetration tests Terminal ballistics X ray radiography
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Hicks, Elmer L.  
Project Engineer

Commander  
Naval Ordnance Systems Command  
ATTN: Code 553Y1 (Mr. Elmer L. Hicks)  
Washington, DC 20360

Autovon: 222-8260  
Telephone: (202) 692-8260

Technical Areas	Small arms program management; Logistics; Weapons systems.
Specialties	Weapon mounts; Machine guns; Gun auxiliary equipment; Logistics; Body armor.
Programs	Weapon mounts: MK 26, 17, 36, 46, 48, 49, 50, 51, 57, 58, 63, 64, 67, 68; Machine guns: 7.62mm, Cal. .50, 20mm, 40mm.
Remarks	Principal point of contact for information on NOSC small arms programs.
Descriptors	Body armor Gun auxiliary equipment Logistics management Machine guns Weapon mounts

Hovanetz, Charles J.  
Engineering Technician

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-RE-A (Mr. Charles J. Hovanetz)  
Dover, NJ 07801

Autovon: 871-3276  
Telephone: (201) 328-3276

Organization	Experimental Evaluation Division Technical Support Directorate
Technical Areas	Aerodynamics; Terminal ballistics; Interior ballistics; Weapon dynamics.
Specialties	Flechettes; Test instrumentation; Fragment velocities; Lethality studies.
Programs	Future Rifle System (FRS); Gas Gun (Helium used to fire flechettes or fragments); Self Supporting Round.
Remarks	Alternate Contact: Carlo DeFranco, Mechanical Engineer.
Descriptors	Body armor Flechettes Fragmentation ammunition Instrumentation Lethality Test equipment Terminal ballistics

Isserow, Saul (Dr.)  
Research Chemist

Director  
Army Materials and Mechanics Research Center  
ATTN: AMXMR-KA (Dr. Saul Isserow)  
Watertown, MA D2172

Autovon: 684-8319  
Telephone: (617) 926-1900 Ext. 319

Organization                      Engineering Materials Development  
Branch Materials Application Division

Technical Areas                      Materials technology for special  
applications

Specialties                      Materials for special applications such  
as nuclear reactors, aerospace, ordnance,  
desalination; uranium, zirconium, refractory  
metals, aluminum, titanium, metal-matrix  
composites; Powder metallurgy.

Programs                      Powder Metallurgy Preforms for  
Forging; Spark Sintering of Ceramic  
and Metal Powder; Ti-Be Composites;  
Improved Aluminum Alloys

Papers                      "Uranium" in Rare Metals Handbook,  
C.A. Hampel, ed., second edition  
(1962); "Processing Irradiated Fuel  
Elements" and "Fluid-Fuel Systems" in  
Nuclear Reactor Fuel Elements: Metallurgy  
and Fabrication, A.R. Kaufman, ed. (1962)  
with R.G. Jenkins, J.G. Hunt, and  
G.I. Friedman, "Fabrication of Tungsten  
and Tungsten-25% Rhenium Tubing", Nuclear  
Applications, 2:304 (August 1966)

Descriptors                      Materials technology  
Powder metallurgy  
Special applications materials



**Jezek, Bruce**  
**General Engineer**

**Commanding Officer**  
**U. S. Army Small Arms System Agency**  
**ATTN: AMXAA-AC (Mr. Bruce Jezek)**  
**Aberdeen Proving Grounds, MD 21005**

**Autovon: 870-5263/4637/5267**  
**Telephone: (301) 278-5263/4637/5267**

<b>Organization</b>	<b>Advanced Concepts and Technology Division</b>
<b>Technical Areas</b>	<b>Under Army Small Arms Program, responsible for exploratory development investigations in: Weapon dynamics; Man/weapon interface; Ballistics research including interior ballistics, exterior ballistics, and wound ballistics; Muzzle device technology; Projectile technology (bullets, flechettes, scimitar, squeexebore, fin-forming cones); system effectiveness; pistol technology.</b>
<b>Specialties</b>	<b>Mathematical models for weapon dynamics; Pistol performance measures; Salvo ammunition effectiveness; Hypervelocity penetration for small arms; Projectile aerodynamics and stability; Cartridge case extraction; Drag reducing fumer projectile.</b>
<b>Programs</b>	<b>Personal Defense Weapon System; Advanced Machine Gun System.</b>
<b>Papers</b>	<b>"Summary of Personal Defense Weapon Program", May 1972</b>
<b>Remarks</b>	<b>Conducted numerous analytical investigations of small arms and larger caliber weapon system including SPIW, caseless, 20mm Bushmaster, and 30mm AX ammunition.</b>
<b>Descriptors</b>	<b>Ballistics Exterior ballistics Interior ballistics Mathematical models Muzzle devices Projectiles Weapon dynamics Wound ballistics</b>

Johnson, Harold E.  
Senior Intelligence Research Analyst (Small Arms)

Commanding Officer  
U. S. Army Foreign Science and Technology Center  
ATTN: AMXST-CB2 (Mr. Harold E. Johnson)  
Charlottesville, VA 22901

Autovon: 274-7475  
Telephone: (703) 296-5171

Organization	Infantry and Aircraft Weapons Branch (CB-2)
Technical Areas	Foreign small arms (includes accessories, tactical use and mechanisms); Small arms ammunition.
Specialties	Mechanical features and military potential of foreign small arms.
Papers	FSTC Small Arms Operation and Identification Guides (3 Vol. ), 2nd ed; many technical reports.
Remarks	Senior analyst for all U.S. Army foreign small arms programs.
Descriptors	Ammunition Foreign small arms Weapon dynamics

Jones, Robert M.  
Chief, Studies Section

Commanding General  
Headquarters U. S. Army Infantry Center  
ATTN: STEBC-MO-M (Mr. Robert M. Jones)  
Fort Benning, GA 31905

Autovon: 835-7654  
Telephone: (404) 545-7654

Technical Areas	Service test instrumentation.
Specialties	Small arms miss distance indicators.
Programs	Automated Range Facilities.
Descriptors	Test range automation.

Kahn, Henry  
Chief, Mathematical Sciences Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L4300 (Mr. Henry Kahn)  
Philadelphia, PA 19137

Autovon: 348-6033  
Telephone: (215) 831-6033

Organization	Pitman-Dunn Laboratory
Technical Areas	Diffusion; Thermodynamics; Interior ballistics; Fluid flow; Heat conduction.
Specialties	Mathematical modeling; Applied mathematics; Differential equations.
Programs	Basic research in physics and mathematics; M16 Rifle; Aluminum cartridge case; M16 System.
Papers	Papers in: diffusion limited precipitation, interior ballistic modeling, data analysis, heat conduction.
Remarks	Frankford Arsenal point of contact for interior ballistics
Descriptors	Heat transfer Interior ballistics Mathematical modeling Thermodynamics

Katsanis, David J. (Dr.)  
Chief, Advanced Concepts and Technology Division

Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-AC (Dr. David J. Katsanis)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5263  
Telephone: (301) 278-5263

Technical Areas	Thermodynamics; Physics of fluids; Systems analysis; Exploratory development in support of small arms research and development.
Specialties	Interior, exterior and terminal ballistics; Design of experiments; Instrumentation; Aerodynamic projectile stabilization
Programs	Exploratory research and development pertaining to: rifles, machine guns, grenade launchers, pistols; Studies to improve ammunition, sights, lubricants, mounts, barrels, etc. for these weapons.
Descriptors	Aerodynamics Ballistic tests Exterior ballistics Interior ballistics Spin stabilized ammunition Systems analysis Terminal ballistics Thermodynamics

Kendall, David P.  
Research Mechanical Engineer

Director  
Benet Weapons Laboratory  
ATTN: SWEWV-RDR-ME (Mr. David P. Kendall)  
Watervliet, NY 12189

Autovon: 974-5024  
Telephone: (518) 273-4610 Ext. 5024

Organization	Materials Engineering Division Research Directorate
Technical Areas	Mechanical behavior of materials: High pressure; High strain rate. Composite materials; Fracture mechanics.
Specialties	Thick-walled cylinder theory; Design for very high pressure; Strain rate effects in metals; Fracture toughness test methods; Fracture of composite materials; Dynamic testing of pressurized cylinders.
Programs	Various programs in above areas.
Papers	Numerous papers on work in above areas.
Descriptors	Autofrettage Composite materials Fracture properties Pressure stress analysis Strain rate effects

Kirkendall, Richard  
Mechanical Engineer, Deputy Branch Chief

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BIL (Mr. Richard Kirkendall)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-4443  
Telephone: (301) 278-4443

Organization	Dynamics Branch Interior Ballistics Laboratory Ballistics Research Laboratory
Technical Areas	Automatic gun mechanisms; Motion analysis of gun systems and mounts.
Specialties	Motion of gun systems and mounts; Optical motion analysis; High speed motion photography.
Programs	Vulcan Air Defense System (Motion analysis of towed version); Yaw analysis (37mm-105mm weapons).
Descriptors	Automatic weapons High speed photography Weapon dynamics Weapon mounts

Kowalick, James F., Dr.  
Chief, Pyrotechnics Development Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-H8200 (Dr. James F. Kowalick)  
Philadelphia, PA 19137

Autovon: 348-6245  
Telephone: (215) 831-6245

Organization	Munitions Development and Engineering Directorate
Technical Areas	High explosives; Pyrotechnics.
Specialties	Tracers; Explosive metalworking; Primers.
Papers	Papers on tracers, explosive welding and explosives.
Descriptors	Explosives Explosives bonding Primers Tracers



**Landis, Elmer**  
**Chief, Munitions Branch**

**Commanding Officer**  
**U. S. Army Land Warfare Laboratory**  
**ATTN: RDLW-DEF (Mr. Elmer Landis)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-4011**  
**Telephone: (301) 278-4011**

<b>Organization</b>	<b>Development Engineering Division</b>
<b>Technical Areas</b>	<b>Special ammunition; Specialty devices.</b>
<b>Programs</b>	<b>Less lethal ammunition; Plastic Blank for M16; Silenced weapons; Counter Ambush Barrage Weapon.</b>
<b>Remarks</b>	<b>Initial point of contact for information on current or recent quick reaction programs in RDT &amp; E Areas.</b>
<b>Descriptors</b>	<b>Lethality Silencers Specialty devices</b>

Lannon, Joseph A. (Dr.)  
Research Chemist

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L6500 (Dr. Joseph A. Lannon)  
Philadelphia, PA 19137

Autovon: 348-7155  
Telephone: (215) 831-7155

Organization	Pitman-Dunn Laboratorys
Technical Areas	Basic research in ignition and combustion, spectroscopy and electrochemistry.
Specialties	Rapid scan spectroscopy; Coatings; Laser spectroscopy; Matrix isolation.
Programs	Research on ignition and combustion.
Papers	Papers on matrix isolation as related to ignition and combustion; Coatings on cartridge cases; Rapid scan spectroscopy.
Remarks	Alternate contact: Dr. L. Gruss
Descriptors	Propellant chemistry Spectroscopy

Lantz, Robert  
Research Chemist (Section)

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-FR-G-C (Mr. Robert Lantz)  
Dover, NJ 07801

Autovon: 880-2794  
Telephone: (201) 328-2794

Organization	Feltman Research Laboratory
Technical Areas	Gas generators; Propellants; High temperature resistant propellants; Formulation, processing and interior ballistics.
Programs	High temperature stable propellants for use in small arms caseless ammunition
Papers	Papers on gas generator propellants; Caseless ammo for small arms.
Descriptors	Caseless ammunition Interior ballistics Propellant chemistry Propellants

Lawrence, Larry R.

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLDG (Mr. Larry R. Lawrence)  
Eglin Air Force Base, FL 32542

Autovon: 872-2163  
Telephone: (904) 882-2163

Organization	Air Force Armament Laboratory
Technical Areas	Gun barrel and high density penetrators
Descriptors	Gun barrels Materials technology Penetrators

Lee, Clayton Richard  
Mechanical Engineer

Commanding Officer  
Combat Developments Command/Maintenance Agency  
ATTN: CDCMA-E (Mr. Clayton R. Lee)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5214  
Telephone: (301) 278-5214

Organization Weapons Mobility Branch

Technical Areas Reliability, maintainability of weapons systems,  
missile systems, mobility systems, small arms  
systems.

Programs Future Rifle System; Firing Port Weapon-MICV;  
Squad Automatic Weapon (SAW).

Papers "Primary User R and M Requirements."

Descriptors Maintainability  
Reliability

Leech, William J. (Dr.)  
Mechanical Engineer  
Applied Mechanics Section

Commanding General  
Headquarters U.S. Army Weapons Command  
ATTN: SWERR-R-EA (Dr. William J. Leech)  
Rock Island, IL 61201

Autovon: 793-5566  
Telephone: (309) 794-5566

Organization	Research Directorate Weapons Laboratory
Technical Areas	Heat transfer.
Specialties	Heat transfer in gun tubes; Thermal stress analysis of gun tubes.
Programs	Squad Automatic Weapon (SAW); 30mm Aircraft Weapon System.
Papers	Several papers and reports on the subject of gun tube heat transfer analysis.
Descriptors	Heat transfer Thermal stress analysis

Lentz, Stanley  
Chief, Dynamics Branch

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BIL (Mr. Stanley Lentz)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-4771  
Telephone: (301) 278-4771

**Organization**

Interior Ballistics Laboratory  
Ballistics Research Laboratory

**Technical Areas**

Small caliber weapons dynamics;  
Automatic weapons; Man-weapon interaction.

**Remarks**

Recent work includes parameter measurement  
for man-weapon interaction analysis.

**Descriptors**

Automatic weapons  
Human factors engineering  
Man machine systems  
Weapon dynamics

Lenz, Ludwig J.  
Project Engineer, Special Weapons and Devices Section

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-DS (Mr. Ludwig J. Lenz)  
Rock Island, IL 61201

Autovon: 793-6349/5554  
Telephone: (309) 794-6349/5554

Organization	Small Arms Weapon Systems Directorate Weapon Laboratory
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Technical Areas	Grenade launchers; Automatic weapons; Links; Linker-delinkers; Small arms training devices such as pop-up target mechanisms and machine gun simulators; Spotting weapons; Arm racks; Foreign weapon evaluation; System analysis and evaluation; Mechanism design and analysis; Production fabrication consultant; Program management.
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Specialties	Low light level sights; Electronic weapon sights (radar); Silencers; Silent weapons; Flash hiders; Muzzle brakes; Targets.
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Programs	Vulcan Air Defense System, Davy Crockett-XM28 and XM129; Silent Weapon System; Small Arms Weapons Study; Armament of surface vessels for SEA; Low light level sights; Novel Electronic Weapon Sight (NEWS); XM172 and XM173 low and high velocity hand crank grenade launchers; XM174 and XM175 low and high velocity grenade launchers; Insert conversion of M1 Rifle from Cal..30 to 7.62mm NATO; Muzzle device for XM19 Rifle; Infantry Training Devices.
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Papers	Technical report on the initial firing of the NEWS on the M16A1 rifle/M203 grenade launcher-AD893938; Letter reports on use of insert to convert Cal. .30 weapon to 7.62mm NATO and evaluation of failures in rifles supplied to a foreign government.
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Lenz, Ludwig J. (cont.)

Remarks

Assisted in establishing and maintaining  
technical reference files on small arms  
in the Special Weapons and Devices Section.  
Selects patents to be filed in Small Arms  
Patent Reference File maintained in Advanced  
Concepts Group.

Descriptors

Gun sights  
Muzzle brakes  
Muzzle flash suppressors  
Silencers  
Targets

Lindsay, John T. (LtCol)  
Chief, Guns and Rockets Branch

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLDG (LtCol. John T. Lindsay)  
Eglin Air Force Base, FL 32542

Autovon: 872-3761 or 3764  
Telephone: (904) 882-3761 or 3764

Organization	Air Force Armament Laboratory
Technical Areas	Military small arms; Aircraft rockets and cannons (plus related systems.)
Specialties	Tactical rockets; Rapid fire gun systems; Low recoil weapons; ammunition.
Descriptors	Aircraft armament Rapid fire weapons Rockets

Lorenzen, Theodore G.  
Chief, Special Weapons and Devices Section

Commanding General  
Headquarter U. S. Army Weapons Command  
ATTN: SWERR-S-DS (Mr. Theodore G. Lorenzen)  
Rock Island, IL 61201

Autovon: 793-6349/5554/4354  
Telephone: (309) 794-6349/5554/4354

Organization	Small Arms Weapon Systems Directorate Weapons Laboratory
Technical Areas	Automatic and semiautomatic weapon mechanisms; Feed mechanisms; Links; Sighting devices; Training devices; Noise suppression devices.
Specialties	Weapon mechanism design and analysis to include effects of ammunition, feeding and links on performance. Test data evaluation with respect to system performance and requirements. RDT and E programming, management and systems engineering.
Programs	40mm Self-Powered Automatic Grenade Launchers; Caseless Ammunition Firing Fixtures, 5.56 and 27mm. ; Multi-Purpose Machine Gun Mount; Aluminum Cased Ammunition Firing Fixtures; Night Sights- Radar and Radio-active Type; Noise suppressors.
Descriptors	Gun feed mechanisms Silencers Training devices Weapon dynamics

Magardo, Robert F.  
Mechanical Engineer

Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-WS (Mr. Robert F. Magardo)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5267  
Telephone: (301) 278-5267

Organization	Weapons Systems Synthesis Division
Technical Areas	Weapon design; Program management for small arms systems.
Specialties	Weapon mechanism design; Caseless and plastic cased ammunition; Personal defense weapons.
Programs	High rate weapons; Firing Port Weapon-MICV.
Remarks	Professional Engineer (Mass.) Reg. No. 20803; Patents-Three issued, one pending.
Descriptors	Caseless ammunition High velocity weapons Personal defense weapons Plastic cased ammunition

Maine, Walter O.  
Chief, Projectile, Incendiary and Selected Systems Analysis Branch

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLYD (Mr. Walter O. Maine)  
Eglin Air Force Base, FL 32542

Autovon: 872-4688/9  
Telephone: (904) 882-4688/9

Organization	Air Force Armament Laboratory
Technical Areas	Gun systems effectiveness.
Specialties	Studies and analyses; Effectiveness methodology.
Programs	GAU-7; GAU-8; Gunship; Lightweight Fighter Gun System.
Papers	Papers on analysis techniques and effectiveness studies.
Remarks	Alternate contacts: Capt. George W. Watt, James F. Starling
Descriptors	Weapons effects Weapon systems

**Mancini, Angelo N. (Jr.)**  
**Serial Flechette Rifle, Program Coordinator**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-J7100 (Mr. Angelo N. Mancini, Jr.)**  
**Philadelphia, PA 19137**

<b>Organization</b>	<b>Ammunition Development Branch</b> <b>Small Caliber Ammunition Division</b> <b>Munition Development and Engineering</b> <b>Directorate</b>
<b>Technical Areas</b>	<b>Research and development of small</b> <b>caliber ammunition; Exterior ballistics;</b> <b>Sabots and flechettes producibility.</b>
<b>Specialties</b>	<b>Flechettes; Tracer flechettes; Sabots.</b>
<b>Programs</b>	<b>Future Rifle Systems; Ammunition Develop-</b> <b>ment.</b>
<b>Descriptors</b>	<b>Exterior ballistics</b> <b>Flechettes</b> <b>Sabots</b>

Marada, Joseph P. (Maj)  
Head, Fire Support Section

Commandant  
Marine Corps Development and Education Command  
ATTN: MCDEC (Maj Joseph P. Marada)  
Quantico, VA 22134

Autovon: 278-2061  
Telephone: (703) 640-2061

Organization	Fire Support Section Mid-Range Branch Studies and Requirements Division
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Technical Areas	Infantry weapons systems.
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Specialties	Knowledge of Marine Corps requirements in infantry weapons systems for the mid- range period (1973-1982).
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Programs	Infantry weapons systems requirements; Review, validation, interservice reconciliation
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Descriptors	Infantry weapons
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**Markgraf, Robert W.**  
**Mechanical Engineer**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-J7200 (Mr. Robert W. Markgraf)**  
**Philadelphia, PA 19137**

**Autovon: 348-6124**  
**Telephone: (215) 831-6124**

<b>Organization</b>	<b>Ballistics and Analytics Branch</b> <b>Munitions Development and Engineering Directorate.</b>
<b>Technical Areas</b>	<b>Mechanical engineering; Machine design.</b>
<b>Specialties</b>	<b>Packaging techniques/materials; Acoustics.</b>
<b>Programs</b>	<b>Squad Automatic Weapon (SAW).</b>
<b>Descriptors</b>	<b>Machine design</b> <b>Packaging</b>



Matsuguma, Harold J.  
Supervisory Chemist

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-FR-E-C (Mr. Harold J. Matsuguma)  
Dover, NJ 07801

Autovon: 880-2210  
Telephone: (201) 328-2210

Organization	Explosives Division Feltman Research Laboratory
Technical Areas	Explosives Chemistry and Technology.
Specialties	Explosives synthesis, kinetics, formulation, manufacture; Pollution abatement, identification and detection.
Programs	Research and exploratory development on explosive synthesis, kinetics, characterization, identification, detection; pollution abatement (in connection with explosives manufacture).
Papers	18 Technical Articles; 10 Technical Present- ations.
Descriptors	Explosives Pollution abatement

Matzkowitz, William  
Supervisory Mathematician, Unit Chief

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-AD-C-S (Mr. William Matzkowitz)  
Dover, NJ 07801

Autovon: 880-4538  
Telephone: (201) 328-4538

**Organization**

Effectiveness Branch  
Concepts and Effectiveness Division

**Technical Areas**

Weapon systems effectiveness.

**Specialties**

Lethal area computation; Expected fraction  
of casualties computation; Flechettes.

**Programs**

Degradation Effects Program; Future Rifle  
System.

**Papers**

"Effectiveness Study of Three 40mm DP Cartridges"; "Ammunition Design Model"; "Lethal Area Estimates of 40mm Cartridges Against Personnel"; "Effectiveness Study of the 40mm MP Scimitar Cartridge".

**Descriptors**

Flechettes  
Lethality  
Weapon effects

McHugh, Robert J.  
Physicist

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7200 (Mr. Robert J. McHugh)  
Philadelphia, PA 19137

Autovon: 348-5979  
Telephone: (215) 831-5979

Organization

Ballistics and Analytics Branch  
Small Caliber Ammunition Division

Technical Areas

Ammunition design; Engineering and  
evaluation.

Specialties

Flechettes; Bullets; Systems effectiveness.

Programs

M16A1 Rifle.

Papers

A number of technical reports on small  
arms.

Descriptors

Ammunition design  
Bullets  
Flechettes

**McKivrigan, James**  
**Mechanical Engineer**

**Commanding Officer**  
**U. S. Army Small Arms Systems Agency**  
**ATTN: AMXAA-WS (Mr. J. McKivrigan)**  
**Aberdeen Proving Ground, MD 21005**

**Autovon: 870-5267**  
**Telephone:(301) 278-5267**

<b>Organization</b>	<b>Weapon Systems Synthesis Division</b>
<b>Technical Areas</b>	<b>Weapon design analysis and redesign.</b>
<b>Programs</b>	<b>M16A1/MOD MICV Firing Port Weapons; Dual Cyclic Rate Weapon; Squad Automatic Weapon (SAW); Future Rifle, .17 cal; Future Rifle, Flechette.</b>
<b>Remarks</b>	<b>Point of contact in above areas.</b>
<b>Descriptors</b>	<b>Weapon mechanisms</b>

McKown, Gary (Dr.)  
Physicist, Advanced Concepts and Technology

Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-AC (Dr. Gary McKown)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5263  
Telephone: (301) 278-5263

Organization	Advanced Concepts and Technology Division
Technical Areas	Electronics; Optics; Spectroscopy; Electro-optics.
Specialties	Image intensifiers; Sighting systems; Microwave spectroscopy; Radio frequency spectroscopy; NMR; Miniature power sources; (fuel cells, batteries).
Programs	Small Arms Sighting Systems (Day, Night); Lightweight Range Finder.
Papers	Numerous papers on spectroscopy, microwave and rf spectroscopy.
Descriptors	Electro-optics Gun sights Gun sight assemblies Nondestructive testing Spectroscopy

**McMillan, Francis**  
**Project Engineer**

**Commander**  
**Headquarters Armament Development and Test Center**  
**ATTN: AFAF-DIRV (Mr. Francis McMillan)**  
**Eglin Air Force Base, FL 32542**

**Autovon: 372-4655**  
**Telephone: (904) 882-4655**

<b>Organization</b>	<b>Vulnerability Assessments Branch</b> <b>Weapons Effects Division</b> <b>Air Force Armament Laboratory</b>
<b>Technical Areas</b>	<b>Terminal effects; Vulnerability assessment..</b>
<b>Specialties</b>	<b>High-density penetrators; 20mm flechettes</b> <b>(effectiveness against aircraft); Pyrophoric</b> <b>penetrator materials.</b>
<b>Programs</b>	<b>GAU-8 support; 20mm flechettes.</b>
<b>Descriptors</b>	<b>Antiaircraft ammunition</b> <b>Flechettes</b> <b>Penetrators</b> <b>Pyrophoric materials</b> <b>Terminal effects</b> <b>Vulnerability</b>

Messina, Joseph  
Chief, Fluids and Lubricants Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L6000 (Mr. Joseph Messina)  
Philadelphia, PA 19137

Autovon: 348-6223  
Telephone: (215) 831-6223

Organization	Chemistry Research Division Pitman-Dunn Laboratory
Technical Areas	Basic and applied research on lubricants for U. S. Army equipment.
Specialties	Lubricating oils, greases, solid films, additives (antioxidant extreme pressure, rust inhibitor); Thickeners; Base fluids; Hydraulic fluids.
Programs	Lubricants, Friction and Wear; Corrosion Preventives; Hydraulic Fluids. These programs include research and development on lubricants for small arms (M16A1, M61, M139, XM140 etc.), fire-control instruments, fuzes, timing devices, meteorological and communication equipment, tanks, missiles, and other military equipment.
Papers	Publications on weapon lubricating oils and greases, thickeners, additive fluids, missile lubricants and hydraulic fluids.
Remarks	Point of contact for lubricants (lubricating oils, greases, solid films) used on military equipment. Many patents on lubricants used for U. S. Army equipment.
Descriptors	Lubricants

**Meyer, Arthur R.**  
**Mechanical Engineer**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: SWERR-S-DC (Mr. Arthur R. Meyer)**  
**Rock Island, IL 61201**

**Autovon: 793-6820/4255**  
**Telephone: (309) 794-6820/4255**

<b>Organization</b>	<b>Small Arms Weapon Systems Directorate Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Small arms design and evaluation.</b>
<b>Specialties</b>	<b>Design, development, test, producibility.</b>
<b>Programs</b>	<b>XM23 and XM24 Helicopter Mounts; M60D Machine Gun Conversion, XM140 30mm Machine Gun; Squad Automatic Weapon.</b>
<b>Remarks</b>	<b>Registered Professional Engineer</b>
<b>Descriptors</b>	<b>Machine guns</b>



Mikula, James J.  
Research Chemist  
Chief, Spectroscopy Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L6000 (Mr. James J. Mikula)  
Philadelphia, PA 19137

Autovon: 348-5244  
Telephone: (215) 831-5244

Organization	Pitman-Dunn Laboratory
Technical Areas	Material science; Propellant research.
Specialties	Spectroscopy of high energy materials; Energy states and transfer in propellant and propellant additive materials.
Programs	AMC Ignition and Combustion Research Program.
Papers	"Electronic Spectra and Intramolecular Energy Transfer in 1-Nitronaptahalene", <u>J. Mol. Spectros.</u> , <u>42</u> , 350-369 (1972). "Electronic States and Energy Transfer in Nitronaphthalenes," (in press), <u>J. Mol. Structure</u> (1973).
Remarks	Alternate contacts Dr. Leonce Harris and Mr. Robert Anderson, Jr. Mr. Mikula is an Adjunct Associate Professor in Physical Chemistry at Temple University.
Descriptors	Materials technology Propellant chemistry Spectroscopy

**Miller, Miles C.**  
**Aerospace Research Engineer**

**Commanding Officer**  
**Chemical Laboratory**  
**ATTN: SMUEA-CL-PA (Mr. Miles C. Miller)**  
**Edgewood Arsenal, MD 21030**

**Autovon: 584-3055/2158**  
**Telephone: (301) 671-3055/2158**

<b>Organization</b>	<b>Physical Research Division</b> <b>Aerodynamics Research Branch</b> <b>Chemical Laboratory</b>
<b>Technical Areas</b>	<b>Aerodynamics; Flight dynamics analysis.</b>
<b>Specialties</b>	<b>Flight dynamics analysis; Computer trajectory simulation; Wind tunnel testing; Math modeling.</b>
<b>Programs</b>	<b>Projectile Performance Analysis</b>
<b>Papers</b>	<b>Numerous papers on aerodynamics and flight performance.</b>
<b>Descriptors</b>	<b>Aerodynamics</b> <b>Computer simulation</b> <b>Mathematical models</b>

Miller, Paul H.  
Sr. Project Engineer

Commander  
Naval Weapons Center  
ATTN: CODE 3015 (Mr. Paul H. Miller)  
China Lake, CA 93555

Autovon: 898-1700 Ext. 2264 or 2265  
Telephone: (714) 939-2264 or 2265

Organization	Aircraft Gun Systems Branch Weapons Systems Division Systems Development Department
Technical Areas	Production of aircraft gun ammunition.
Specialties	20mm ammunition production.
Programs	Navy MK 100 Series 20mm ammo.
Remarks	Alternate contact: Gordon Chantler Chairman of JTCG/ALNNO/WPFC/Aircraft Gun Ammunition Study Group (AGASG).
Descriptors	Aircraft ammunition

Milway, William B.  
Electronic Engineer  
(Instrumentation)

Commanding General  
U. S. Army Test and Evaluation Command  
ATTN: AMSTE-RU (Mr. William B. Milway)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5278  
Telephone: (301) 273-5278

**Organization**

Instrumentation Directorate

**Technical Areas**

Electronic instrumentation; Fire control systems associated with night vision devices.

**Specialties**

Instrumentation for measuring muzzle flash, chamber pressure, sound levels, blast pressure luminosity of tracer and ammunition velocity; Projectile tracking radar and velocimeters; Automatic scoring devices. Aircraft electronic fire control systems.

**Descriptors**

Fire control systems  
Muzzle flash tests  
Pressure tests  
Test equipment  
Tracer ammunition  
Velocity tests

Monahan, Hugh (Jr.)  
Mechanical Engineer/Chemical Engineer  
Munitions Applications Branch

Commanding Officer  
Edgewood Arsenal  
ATTN: SMUEA-DE-MM (Mr. Hugh Monahan, Jr.)  
Edgewood Arsenal, MD 21010

Autovon: 584-2169  
Telephone: (301) 671-2169

Organization	Munition Systems Division Development and Engineering Directorate
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Technical Areas	Dissemination of chemical agents (dissemination technology); Fuzing (pyrotechnic and mechanical); Interior ballistics (40mm); Exterior ballistics (40mm); Dissemination of colored smokes.
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Specialties	Low velocity 40mm (grenade) munitions.
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Programs	XM 627 CS Riot Control Cartridge; 40mm Grenade; M651 CS Tactical Cartridge; 40mm Colored Smoke Munitions.
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Descriptors	Dissemination technology Exterior ballistics Fuzes Grenades Interior ballistics Riot control cartridges
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Mowrey, Fred H.  
CDC Staff Officer

Commanding Officer  
Headquarters U. S. Army Combat Developments Command  
ATTN: CDC-MS-W (Mr. Fred H. Mowrey)  
FT. Belvoir, VA 22060

Autovon: 354-337/1319  
Telephone: (703) 664-3337/1319

Organization	Material Systems Directorate Weapons Division
Programs	Personal Defense Weapon; Future Rifle System; Squad Automatic Weapon.
Descriptors	Automatic weapons Personal defense weapons

Nardone, John  
Materials Engineer  
Project Leader, Materials Design and Evaluation Section

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-FR-M-MA (Mr. John Nardone)  
Dover, NJ 07801

Autovon: 880-3098  
Telephone: (201) 328-3098

Organization	Feltman Research Laboratory
Technical Areas	Materials application; Plastic material selection, Design and production; Ammunition design.
Specialties	Plastics design and production for military application, to include ammunition, weapons and communication equipment.
Programs	Rotating Bands; Encapsulated Mine Components; Cartridge Cases; Communication Cases and Handsets; Reinforced Plastic Rocket Motor Cases, Projectile Grommets; Gears and miscellaneous ammunition components.
Papers	Picatinny Arsenal technical reports related to areas described in above programs.
Remarks	New Jersey Professional Engineers License
Descriptors	Ammunition Plastics Plastic cartridge cases Rotating bands

Norausky, Patrick H. (Jr.)  
Chief, Advanced Concepts Group

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-A (Mr. Patrick H. Norausky, Jr.)  
Rock Island, IL 61201

Autovon: 793-4633  
Telephone: (309) 794-4633/6623

Organization	Small Arms Weapon System Directorate Weapons Laboratory
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Technical Areas	Operations research; Weapon kinematics and dynamics; Material behavior; Testing; Interior, exterior and terminal ballistics; Applied mechanics; Heat and mass transfer
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Specialties	Test instrumentation; Fatigue analysis and testing; Mathematical modeling (digital, analog and hybrid computers); Operations research; Human factors engineering; Advanced small arms concepts.
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Programs	XM140; 30mm Automatic Cannon; Future Point Fire Weapon Systems; Future Grenade Launcher Systems; Hypervelocity Weaponry; Gun Barrel Technology; Graded Lethality; Future Personal Defense Weapon Systems; DESVAL and Components Applied Research A607 (now ACT)
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Papers	Papers on: weapon dynamics, material behavior, future personal defense weapon systems, future grenade launcher systems, future point fire weapon systems, operations research, test instrumentation.
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Remarks	Registered Professional Engineer State of Missouri, E12095; Commercial Pilot.
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Norausky, Patrick H.  
Chief, Advanced Concepts Group (cont.)

**Descriptors**

Computer simulation  
Fatigue (materials)  
Human factors engineering  
Mathematical models  
Weapon tests

**Ofner, Robert**  
**Chemist, Nonmetallic Materials**  
**Application Team**

**Commanding General**  
**Headquarters U.S. Army Weapons Command**  
**ATTN: SWERR-R (Mr. Robert Ofner)**  
**Rock Island, IL 61201**

**Autovon: 793-5039**  
**Telephone: (309) 794-5039**

<b>Organization</b>	<b>Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Material science (nonmetallics)</b>
<b>Specialties</b>	<b>Rubber and plastic compounding and processing.</b>
<b>Programs</b>	<b>Development of Nonmetallic Belt Links; Development of Plastic Rifle Stocks; Development of Plastic Rifle Magazines.</b>
<b>Remarks</b>	<b>Alternate contacts: John Cerny and Wilbur Veroeven.</b>
<b>Descriptors</b>	<b>Gun stocks Magazine assemblies Materials technology Plastics</b>

O'Hara, Glenn P.  
Mechanical Engineer

Director  
Watervliet Arsenal  
ATTN: SWEWV-RDR-AMM (Mr. Glenn P. O'Hara)  
Watervliet, NY 12189

Autovon: 974-5518  
Telephone: (518) 273-4610 Ext. 5518

Organization	Benet Research Laboratory
Technical Areas	Cannon-oriented research in structures- primarily pressure vessel components, breech rings, breech blocks, etc.
Specialties	Finite element stress analysis using the NASTRAN Program; Experimental stress analysis using strain gauges and 2- or 3- dimensional photoelasticity; General mechanical measurement under static or dynamic conditions.
Programs	Study of threaded connections; XM199 Screw Block Breech; Design of Swage Autofrettage Mandrels; Stress Analysis of an Air Force Reel Pallet.
Papers	"Elastic Stress Analysis of Short Cylindrical Swage Mandrels", Proceedings of the Third Navy/NASTRAN Colloquium, NSRDC, 22-23 March 1972; "Photoelastic Stress Analysis of a High Pressure Breech", Watervliet Arsenal Report WVT-7057, December 1970
Descriptors	Autofrettage Breech blocks Swaging Stress analysis

Owen, William J., (MAJ)  
Chief, Analysis and Data Reduction Section

Commanding General  
Headquarters U. S. Army Infantry Center  
ATTN: STEBC-MO-M (MAJ William J. Owen)  
Fort Benning, GA 31905

Autofon: 835-2177  
Telephone: (404) 545-2177

Technical Areas	Analysis of small arms test data.
Specialties	Numerical analyses.
Programs	M16A1 Subcaliber Device; M16 Burst Control Device.
Descriptors	Weapons test data

Packard, Charles F.  
Mechanical Engineer

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR (Mr. Charles F. Packard)  
Rock Island, IL 61201

Autovon: 793-4442  
Telephone: (309) 794-4442

Organization	Weapons Laboratory
Technical Areas	Development engineering; Program management.
Specialties	Small arms design and evaluation.
Programs	M16A1 Rifle; M14 Rifle; M21 Sniper Rifle; XM19 Rifle; XM90 Spotting Rifle; Project SALVO; T48 Rifle; T44 Rifles; Project ALPHA.
Papers	Notes on development material; Various weapons test reports-T48 Rifle; Project SALVO; Papers on foreign weapon evaluations.
Remarks	Professional Engineer, Massachusetts #20037
Descriptors	Shoulder weapons Small arms design

**Paone, Joseph F. (MAJ)**  
**Major, Infantry Project Officer**  
**Studies Division**

**Commanding General**  
**Headquarters U. S. Army Infantry Center**  
**ATTN: CDCIN-S (MAJ. Joseph F. Paone)**  
**Fort Benning, GA. 31905**

**Autovon: 835-2015/2324**  
**Telephone: (404) 545-2015/2324**

<b>Organization</b>	<b>US Army Combat Developments Command Infantry Agency</b>
<b>Technical Areas</b>	<b>Mechanical engineering and operations research; System description, application and evaluation.</b>
<b>Specialties</b>	<b>Mathematical modeling to evaluate system effectiveness; Systems analysis.</b>
<b>Programs</b>	<b>Army Small Arms Requirements Study (ASARS); Army Small Arms Program (ARSAP).</b>
<b>Papers</b>	<b>Papers on modeling, measurement of effect- iveness and quantification of human factors in system evaluation.</b>
<b>Descriptors</b>	<b>Human factors Mathematical models Systems analysis Weapons effects</b>

Partridge, Daniel A.  
Electronics Engineer  
Land Range Development Section

Commander  
Headquarters Armament Development and Test Center  
ATTN: ADTC-TSGGL (Mr. Daniel A. Partridge)  
Eglin Air Force Base, FL 32542

Autovon: 872-4482  
Telephone: (904) 882-4482

Organization	Air Force Systems Command Armament Development and Test Center Engineering Division
Technical Areas	Gun testing
Specialties	Test instrumentation and facilities
Programs	GAU-7/A Automatic Guns; GAU-8/A Automatic Guns.
Remarks	Alternate Contact: Mr. J. J. Bauer
Descriptors	Test equipment Weapons tests

**Pearlstein, Fred**  
**Chief, Corrosion Research Branch**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-L6000 (Mr. Fred Pearlstein)**  
**Philadelphia, PA 19137**

**Autovon: 348-6401**  
**Telephone: (215) 831-6401**

<b>Organization</b>	Chemistry Research Division Pitman-Dunn Laboratory
<b>Technical Areas</b>	Basic and applied research on corrosion, corrosion inhibition and metal coating processes.
<b>Specialties</b>	Autocatalytic (electroless) plating of metals, chemical and electrochemical conversion coat- ings; electrochemical machining; corrosion and corrosion inhibition mechanisms.
<b>Programs</b>	Corrosion and wear resistant coatings for metals including applications to the M16A1 rifle and M564 mechanical time fuze; Flechettes; M572E2 gearless S and A fuze and other components of military equipment.
<b>Papers</b>	Publications on electroless plating, galvanic corrosion, electrochemical and machining, electrophoretic deposition, high temperature oxidation, conversion coatings for metals and corrosion of metals in tropical environments.
<b>Remarks</b>	Six patents in the field of protective coatings for metals.
<b>Descriptors</b>	Coatings Corrosion Corrosion inhibitors Stress corrosion



Penn, Harry G.  
Production Manager

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-T5000 (Mr. Harry G. Penn)  
Philadelphia, PA 19137

Autovon: 348-6054  
Telephone: (215) 831-6054

Organization	Manufacturing Technology Directorate Small Caliber Ammunition Modernization and Engineering Division
Technical Areas	Plant management and operation; Development and standardization of small arms ammunition manufacturing processes; Process, operations and facilities evaluation; Small caliber modern- ization programs.
Specialties	Small caliber cartridge components; Assemblies and cartridge manufacture; Inspection tests and ancillaries.
Programs	Small Caliber Ammunition; Small Caliber Am- munition Modernization Program (SCAMP); Pro- duction trouble shooting.
Papers	Published papers pertinent to assigned activities.
Remarks	Alternate- Mr. Vincent Walters (Frankford Arsenal).
Descriptors	Ammunition

Pepe, Joseph (Dr.)  
Research Metallurgist

Director  
Watervliet Arsenal  
ATTN: RDR-ME (Dr. Joseph Pepe)  
Watervliet, NY 12189

Telephone: (518) 273-4610

**Organization**

Materials Engineering Branch  
Research Directorate  
Benet Weapons Laboratory

**Technical Areas**

Deformation and fracture; Non-equilibrium metallurgical reactions; Short-time dynamic elevated temperature properties; Physical metallurgy.

**Specialties**

Physical metallurgy; Deformation and fracture; Welding metallurgy.

**Programs**

Thermo- Mechanical Working of High Strength Steel; Erosion Mechanisms and Prevention; Deformation Modes/Fracture Characteristics.

**Papers**

Published papers in area of: Non-equilibrium metallurgical reactions, interaction of deformation modes and subsequent fracture, erosion, ultra -high heating rate studies.

**Descriptors**

Erosion  
Fracture properties  
Metallurgy  
Temperature effects  
Welding

Peters, Joseph R.  
Research Mechanical Engineer

Director  
U. S. Army Materials and Mechanics Research Center  
ATTN: AMXMR-TE (Mr. Joseph R. Peters)  
Watertown, MA 02172

Autovon: 684-8558/8433  
Telephone: (617) 926-1900 Ext. 558/433

Organization	Engineering Mechanics Division, Mechanics Research Laboratory
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Technical Areas	Study of spallation and fracture patterns in armor materials; Investigation of stress waves and failure patterns; Terminal ballistics; Development of the HEMP Code to predict failures in armor materials.
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Specialties	Utilization of high-speed photography and flash X-ray systems. Development of special photo-optical systems for unique applications.
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Programs	Validation of analytical models and assumptions utilizing ballistic experimentation. Incipient damage levels and propagation of failures in armor materials.
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Papers	"Penetration Characteristics of Biaxially Stretched Acrylic when Impacted with Caliber .0.30 APM2 Projectiles".
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Remarks	Professional Engineer, State of Massachusetts. Alternate contact: Mr. John F. Mescall, Mathematician Autovon 684-8376.
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Descriptors	High speed photography Terminal ballistics Terminal effects X-ray radiography
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Phelps, John D.  
Supervisory Engineer  
(Instrumentation)

Commanding General  
Headquarters U. S. Army Test and Evaluation Command  
ATTN: AMSTE-RU (Mr. John D. Phelps)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-5289  
Telephone: (301) 278-5289

**Organization**

Headquarters  
U. S. Army Test and Evaluation Command  
Instrumentation Directorate

**Technical Areas**

Electronic engineering; Radar; Telemetry;  
Ballistic data recording; Blast and pressure  
measurement.

**Specialties**

Piezoelectric pressure recording; Doppler  
velocity radars; Magnetic tape recording  
systems; Projectile airburst and impact  
locating system.

**Papers**

Doppler Calibrator for Radar Velocimeters;  
Airblast Pressure Measurement.

**Remarks**

Point of contact for above areas.

**Descriptors**

Piezoelectric gauges  
Proof test equipment  
Test ranges  
Weapons testing

**Post, John S.**

**Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-DI (Mr. John S. Post)  
Rock Island, IL 61201**

**Autovon: 793-6348  
Telephone: (309) 794-6348**

<b>Organization</b>	<b>Small Arms Weapons Systems Directorate Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Weapon design</b>
<b>Specialties</b>	<b>Noise Suppressors; Muzzle device.</b>
<b>Programs</b>	<b>Ring Airfoil Grenade Launcher; Future Rifle System; FPW/MICV.</b>
<b>Papers</b>	<b>"A Computer Analysis Program for the Rifle Application".</b>
<b>Descriptors</b>	<b>Muzzle devices Silencers</b>

**Prischmann, Clinton**  
**Mechanical Engineer**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: SWERR-S-DI (Mr. Clinton Prischmann)**  
**Rock Island, IL 61201**

**Autovon: 793-4251**  
**Telephone: (309) 794-4251**

<b>Organization</b>	<b>Small Arms Weapon Systems Directorate Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Interior ballistics; Weapons design and analysis; Fatigue of metals.</b>
<b>Specialties</b>	<b>Math modeling</b>
<b>Programs</b>	<b>M16A1 Rifle; M20s Grenade Launcher; M1911A1 Pistol; Personal Defense Weapons; XM138 155mm Lightweight SP Howitzer.</b>
<b>Papers</b>	<b>Papers on mathematical analysis of recoil operated pistols, design and analysis of control grooves for artillery recoil brakes, cyclic stability of mild steel and 2024-T4.</b>
<b>Discriptors</b>	<b>Mathematical models Small arms design</b>

Quittman, William  
Metallurgist

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-K3310 (Mr. W. H. Quittman)  
Philadelphia, PA 19137

Organization	Materials Engineering and Metallurgy Section Materials Branch Test and Evaluation Division Technical Support Directorate
Technical Areas	Foreign cartridge exploitation
Specialties	Evaluation of metallic cartridge components
Programs	Foreign Materiel Exploitation Program.
Papers	Numerous reports for the above program.
Descriptors	Ammunition Materials technology

Reagan, Robert  
System Engineer  
Ammunition Development Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7100 (Mr. Robert Reagan)  
Philadelphia, PA 19137

Autovon: 348-5522  
Telephone: (215) 831-5522

Organization	Small Caliber Ammunition Division Munitions Development and Engineering Directorate
Technical Areas	Transition ballistics; Exterior ballistics; Terminal ballistics; Systems effectiveness.
Specialties	Flechette dispersion; Experimental techniques in transition ballistics regime; System engineering.
Programs	Serial Flechette Rifle Program; Multiple Flechette Rifle Program; Serial Bullet Rifle Program; Improved 30mm Ammuni- tion for WECOM.
Papers	Papers on flechette dispersion; Papers and reports on armor penetration.
Descriptors	Exterior ballistics Systems effectiveness Terminal ballistics Transition ballistics



**Reed, Frederick P.**  
**Mechanical Engineer**

**Commanding General**  
**Headquarters U.S. Army Weapons Command**  
**ATTN: SWERR-S-DS(Mr. Frederick P. Reed)**  
**Rock Island, IL 61201**

**Autovon: 793-5554 or 6349**  
**Telephone: (309) 794-5554 or 6349**

<b>Organization</b>	<b>Small Arms Weapon Systems Directorate Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Applied research; Concept exploratory development; Advanced development for small arms weapon systems.</b>
<b>Specialties</b>	<b>Weapons design, testing, instrumentation; Kinematic evaluation of prototype weapons up to preparation for production; Feed mechanisms; Weapon evaluations.</b>
<b>Programs</b>	<b>Special Purpose Individual Weapon (SPIW); Spotting Rifles: XM122, M8, XM69, Machine Guns: M73, M60, M85, XM140; Grenade Launchers: M79, XM174, XM175, CROW, Hand Held. Other projects: Silent Weapons, Caseless, Aluminum Cased, Mini-Bore, Cal .122 and M16.</b>
<b>Papers</b>	<b>Reports on: Caseless Ammunition Obturation Devices; The Protector (Mini-Projectile Weapon System).</b>
<b>Remarks</b>	<b>Duties include or have included a variety of assignments as need occurred: EX 122 Task Force Team, Alpha Design Review Committee, XM30 Task Force Estimated and Evaluation, Long Range Technical Forecasting Committee, SA New Concept Coordinator, Review and Eval- uation Team for Commercial New Concept, AAFSS Review Team, etc.</b>

**Reed, Frederick P. (cont.)**

**Descriptors**

**Gun feed mechanisms**

**Machine guns**

**Small arms design**

**Weapon dynamics**

**Weapons tests**

**Reynolds, John**  
**Mechanical Engineer, Chief, Advanced Concepts Division**

**Commanding General**  
**Headquarters U.S. Army Weapons Command**  
**ATTN: SWERR-W-A (Mr. John Reynolds)**  
**Rock Island, IL 61201**

**Autovon: 793-6510**  
**Telephone: (309) 794-6510**

<b>Organization</b>	<b>Aircraft Weapons Systems Directorate</b> <b>Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Aircraft weapons systems; Turrets;</b> <b>Weapon dynamics; Fire control; Control</b> <b>and stabilization.</b>
<b>Specialties</b>	<b>Liquid propellant weapons; Fire control;</b> <b>Systems applications; Fluidic controls.</b>
<b>Programs</b>	<b>Advanced Concepts for Automatic Aircraft</b> <b>Cannon.</b>
<b>Descriptors</b>	<b>Aircraft armaments</b> <b>Liquid propellant guns</b>

**Rhoades, Charles J.**  
**Chief, Design and Development Group**

**Commanding General**  
**Headquarters U. S. Army Weapons Command**  
**ATTN: SWERR-S (Mr. Charles Rhoades)**  
**Rock Island, IL 61201**

**Autovon: 793-5234/4534**  
**Telephone: (309) 794-5234/4534**

<b>Organization</b>	<b>Small Arms Weapon Systems Directorate Weapons Laboratory</b>
<b>Technical Areas</b>	<b>Weapon mechanisms; Weapon dynamics; Interior ballistics; Small caliber amm- unition design and development.</b>
<b>Specialties</b>	<b>Small caliber weapon systems development; Small caliber ammunition development; High- rate mechanism development; Flechette-firing weapons development.</b>
<b>Programs</b>	<b>M16A1 Rifle; 7.62mm ammunition; 5.56mm ammunition; XM645 cartridge; Multiple Flechette Cartridges; XM19 Rifle (and other FRS rifle candidates); M203 and 30mm Grenade Launchers.</b>
<b>Papers</b>	<b>Several technical reports on 5.56mm ammunition; M16A1 rifle.</b>
<b>Remarks</b>	<b>Prior experience includes five years in the M16 rifle project managers's office</b>
<b>Descriptors</b>	<b>Flechettes Multiple flechette rifles Weapon dynamics Weapon systems</b>

Riffin, Paul V.  
Program Manager for Armaments Material

Director  
U. S. Army Materials and Mechanics Research Center  
ATTN: AMXMR-HM (Mr. Paul Riffin)  
Watertown, MA 02172

Autovon: 684-8404  
Telephone: (617) 926-1900 Ext. 404

Technical Areas	Armor materials; Armament materials and other structural alloys employed in engineering equipment. Background in physical and mechanical metallurgy and the engineering applications of metallic materials, high-strain rate behavior, fracture and flow, and terminal ballistics.
Specialties	High-strength alloys; Fracture toughness; Alloy development in uranium, titanium, steel and aluminum alloys.
Programs	Fragmentation Artillery Shell; Bushmaster; Lance Warhead; 105mm APDS and HEAT Projectile Materials.
Papers	Papers on improved fragmentation steel, pyrophoric materials, high-strain rate behavior, wear-resistant gun components.
Remarks	Point of contact, coordinator, and advisor regarding personnel and facilities of AMMRC for utilization in the small arms field.
Descriptors	Fracture properties Materials technology Metals Metallurgy Pyrophoric materials Strain rate effects

Roane, Lester  
Chief, Industrial & Quality Assurance Division

Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-I (Mr. Lester Roane)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-4623/4618  
Telephone: (301) 278-4623/4618

Technical Areas:                      Weapon and ammunition production; Weapon and ammunition quality control; Reliability, availability, maintainability (RAM); Cost effectiveness.

Specialties                              Test instrumentation; Training devices; Test and evaluation.

Programs                                M16A1: Product Improvement, Low Light Level Sight, Rim Fire Adapter, Laser Training Device, National Match/Sniper Conversion; M203GL: Training Grenade; Future Rifle System (FRS); Squad Automatic Weapon (SAW); Firing Port Weapon- MICV; Dual Cycle Rifle; RAM Modeling; Flechette Ammunition; Long Recoil Weapons; Personal Defense Weapons.

Papers                                    "Dual Cycle Rifle", Army R&D Magazine.

Remarks                                Professional Engineer (Texas & Maryland)  
Alternates: J. F. Thompson, W. H. Klotsas  
E. P. Virene

Descriptors                              Ammunition  
Maintainability  
Quality control  
Reliability  
Test equipment  
Weapon fabrication

Robbins, John  
Project Engineer

Commandor  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DL DL (Mr. John Robbins)  
Eglin Air Force Base, FL 32542

Autovon: 872-5426  
Telephone: (904) 882-5426

Organization

Guns and Rockets Division  
Air Force Armament Laboratory

Technical Areas

Gun design; Ammunition design;  
Gun systems; Interior ballistics;  
Exterior ballistics.

Specialties

Gun mechanisms; Small arms-man  
interaction; Silencers; Projectile design;  
Cartridge design; Small arms sights and  
sighting; Gun barrel erosion firings;  
Plastic jacketed projectiles.

Programs

GUU 4/P (IMP, Stockless); Gun barrel  
erosion firings; Plastic jacketed small  
cal. ammunition, Plastic jacketed large  
cal. ammunition.

Remarks

Responsible for Air Force small arms -  
personal defense weapon development programs.

Descriptors

Cartridges  
Erosion  
Gun feed mechanisms  
Gun sights  
Human factors engineering  
Plastic cased ammunition  
Projectiles  
Silencers  
Weapon dynamics

Roberts, Earl D., Jr.  
Equipment Specialist (Ord)

Commandant  
Headquarters U. S. Army Infantry Center  
ATTN: ATSN-I-M- (Mr. Earl D. Roberts Jr.)  
Fort Benning, GA 31905

Autovon: 835-3022/1670  
Telephone: (404) 545-3022/1670

Organization	United States Army Infantry School
Technical Areas	Characteristics of small arms as related to suitability for infantry use; Lethality; Hit probability; Human engineering.
Specialties	Test and evaluation of small arms; Infantry requirements for small arms to include operational characteristics, tactics and techniques.
Programs	Small Arms Weapons Systems Study; Infantry Rifle Unit Study; SPIW Tests; M16A1 Rifle; Stoner Weapons Systems; AR 18 Rifle; H&K Rifle.
Papers	Papers on small arms tests and evaluations; Requirements documents; Infantry community positions on small arms requirements; Small arms studies.
Descriptors	Infantry training Weapons tests Small arms



Rocha, John G.  
Mechanical Engineer

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-W-A (Mr. John G. Rocha)  
Rock Island, IL 61201

Autovon: 793-4445  
Telephone: (309) 794-4444

Organization

Weapons Laboratory

Technical Areas

Design and development of military small arms including rifles, light and heavy machine guns, automatic cannon up to 30mm size, automatic 40mm grenade launchers, both low and high velocity. Also design of systems employing liquid or caseless propellants and design and development of special test fixtures for same.

Specialties

Design of weapon systems as noted above, especially evolution of new mechanism concepts to suit system requirements. Analysis of ballistic factors to assure compatibility of weapon system and ammunition. Experienced as consultant on all items noted herein, especially analysis of helicopter armament systems.

Programs

Rifles: SPIW; 7.62mm M14 and T48 Carbine; machine guns: M60, misc. ground and tank (7.62mm) and 23mm Bushmaster; Grenade Launchers: Single and three-shot launchers; Automatic M75, M129 XM140 systems; Automatic Cannon: 30mm AMC weapon.

Papers

Authored book, "Small Arms Design Principles" 1968.

Remarks

Registered Professional Engineer-Massachusetts; Taught Strength of Materials, Math, related subjects. Alternate contact: Frederick R. Reed, SWERR-S.

Descriptors

Aircraft armaments  
Automatic weapons  
Grenade launchers  
Machine guns  
Weapon systems

**Romero, Eduardo S.**  
**Program Manager**

**Commander**  
**Naval Weapons Center**  
**ATTN: CODE 3015 (Mr. Eduardo S. Romero)**  
**China Lake, CA 93555**

**Autovon: 898-1700 Ext. 2264**  
**Telephone: (714) 939-2264**

<b>Organization</b>	<b>Aircraft Gun Systems Branch</b>
<b>Technical Areas</b>	<b>Aircraft gun system R and D management; Liquid propellant guns; Interior ballistics.</b>
<b>Specialties</b>	<b>Liquid propellant guns; Non-hypergolic bipropellant systems; Gun mechanizations; Interior ballistics.</b>
<b>Programs</b>	<b>25mm Light Weight Liquid Propellant Aircraft Gun System.</b>
<b>Remarks</b>	<b>Alternative contacts: Robert Gould, Ext. 2668; Dr. Stanley Wood, Ext. 7317; Larry Liedtke, Ext. 2203.</b>
<b>Descriptors</b>	<b>Aircraft armaments Interior ballistics Liquid propellant guns</b>

Rutland, J. Andrew  
Project Engineer

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLRV (Mr. J. Andrew Rutland)  
Eglin Air Force Base, FL 32542

Autovon: 872-4651  
Telephone: (904) 882-4651

**Organization**

Vulnerability Assessments Branch  
Weapons Effects Division  
Air Force Armament Laboratory

**Technical Areas**

**Terminal effects/Vulnerability assessment.**

**Specialties**

**Aircraft targets.**

**Programs**

GAU-7 20mm; GAU-7 25mm; GAU-7  
56mm; Aircraft cannon parameters fuze  
study.

**Descriptors**

**Target vulnerability  
Terminal effects**

**Rutkovsky, Hyman D.**  
**Chief, Ammunition Engineering Branch**

**Commanding Officer**  
**Picatinny Arsenal**  
**ATTN: SMUPA-AD-E-C (Mr. Hyman D. Rutkovsky)**  
**Dover, New Jersey, NJ 07801**

**Autovon: 880-4059**  
**Telephone: (201) 328-4059**

<b>Organization</b>	<b>Ammunition Development Engineering Directorate</b>
<b>Technical Areas</b>	<b>Industrial engineering of a variety of conventional munitions.</b>
<b>Specialties</b>	<b>Technical direction of pre-standardization engineering liaison, studies, estimates and evaluation essential to the transition of newly developed mission items into quantity production; Engineering for efficient production in volume, including pre-production evaluation and pilot production operations.</b>
<b>Programs</b>	<b>Mines; Grenades; Demolition items; Anti-personnel munitions; Aircraft rockets (2.75"); Infantry rockets (LAW); Guided missile warheads.</b>
<b>Papers</b>	<b>Numerous documents and reports on production of conventional munitions.</b>
<b>Remarks</b>	<b>Point of contact for production of conventional munitions. Licensed Professional Engineer-New Jersey.</b>
<b>Descriptors</b>	<b>Ammunition Grenades Munitions industry Rockets</b>

Samos, George  
Physical Scientist, Dynamics Branch

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BIL (Mr. George Samos)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-2411  
Telephone: (301) 278-2411

Organization	Interior Ballistics Laboratory Ballistic Research Laboratory
Technical Areas	Gas dynamics; Ammunition studies.
Specialties	Piston primers; Airborne particle ingestion; Sabot ingestion; Toxicity of muzzle gases.
Programs	SPIW (YM 19).
Descriptors	Gas dynamics Primers

Sauber, John  
Senior Engineer-Aircraft Guns and Ammunition

Commander  
Naval Air Systems Command  
Code-AR-53234 (Mr. John Sauber)  
Washington, DC 20360

Autovon: 222-3892  
Telephone: (202) 692-3892

Organization	Conventional Weapons Branch Armament Division
Technical Areas	Engineering development of aircraft guns and ammunition; Primary calibers in and around 20mm and 30mm; Gun design.
Programs	20mm Aircraft Gun Pad GPU-2/A; 20mm General Purpose Projectile; 20mm Aircraft Gun Mk11; 20mm Aircraft Gun M 197; 20mm Aircraft Gun Pod MK4.
Descriptors	Aircraft ammunition Aircraft armaments

Schlenner, Robert J.  
Physicist, Ammunition Development Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7000 (Mr. Robert J. Schlenner)  
Philadelphia, PA 19137

Autovon: 348-6648  
Telephone: (215) 831-6648

Organization	Small Caliber Ammunition Division Munitions Development and Engineering Directorate
Technical Areas	Exterior ballistics; Terminal ballistics; Mathematical models; Cartridge design.
Specialties	Math modeling to predict cartridge performance; Penetration mechanics; Flechettes; Tracer projectile design.
Programs	Squad Automatic Weapon System; Personal Defense Weapon System; Advanced Machine Gun Concepts.
Papers	Paper on 68 grain ammunition for Stoner machine gun; Paper on ammunition for Squad Automatic Weapon System.
Descriptors	Ammunition Exterior ballistics Flechettes Mathematical models Terminal ballistics

Schumacher, Carrol  
Mechanical Engineer

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-DI (Mr. Carrol Schumacher)  
Rock Island, IL 61201

Autovon: 793-6518  
Telephone: (309) 794-6518

Organization	Small Arms Weapon Systems Directorate Weapon Laboratory
Technical Areas	Weapon mechanism design; Small arms mechanism kinematics.
Specialties	Small caliber weapon design; Weapon mal- function analysis.
Programs	Personal Defense Weapon; M16A1 Rifle; MICV-Firing Port Weapon; XM15 General Officers Pistol; M16 National Match Rifle.
Papers	Papers addressing redistribution of force- time function applied to shooter
Descriptors	Kinematics Small arms design Weapon dynamics



Schupp, Walter  
Project Engineer, Rifle Ammunition  
Ammunition Development Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J7100 (Mr. Walter Schupp)  
Philadelphia, PA 19137

Autovon: 348-5522/5872  
Telephone: (215) 831-5872/5522

Organization	Small Caliber Ammunition Division Munitions Development and Engineering Directorate.
Technical Areas	Interior ballistics; Exterior ballistics, Transition ballistics.
Specialties	Flechettes; Pusher type sabot; Tracer flechettes; Puller type sabots.
Programs	Ammunition for Future Rifle Program; Multiple Flechette Pusher and Puller Sabot Concepts.
Papers	"Feasibility of Launching Three Flechettes Simultaneously by Means of Puller Sabots." R-1923 April 1969. Various final reports prepared by development contractors for both pusher and puller multiple flechette ammunition.
Descriptors	Ammunition Exterior ballistics Flechettes Interior ballistics Transition ballistics Sabots

Shaff, Larry T.  
General Engineer, Ground Munitions Branch

Commanding Officer  
Edgewood Arsenal  
ATTN: SMUEA-DE-MG (Mr. Larry T. Shaff)  
Edgewood Arsenal, MD 21010

Autovon: 584-2169/4142  
Telephone: (301) 671-1269/4142

Organization	Munitions Systems Division Development and Engineering Directorate
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Technical Areas	Development of chemical weapons and ammunition for riot control, civil disturbance and tactical use. Involves mechanical, chemical, and electrical engineering aspects.
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Specialties	Chemical weapon/ammunition engineering design, testing, and evaluation.
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Remarks	Point of contact for 40mm chemical cartridges. Work on 40mm chemical cartridges has extended over the past 4½ years. Patent on an airborne chemical dispenser.
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Descriptors	Chemical ammunition Incapacitating agents Riot control weapons
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Shanahan, C. O., Jr.  
Technical Assistant to Chief, Small Arms Test Branch

Commanding General  
Headquarters US Army Infantry Center  
ATTN: STEBC-TE-SA (Mr. C. O. Shanahan)  
Fort Benning, GA 31905

Autovon: 835-3456/5916  
Telephone: (404) 545-3456/5916

Organization	Test Division U. S. Army Infantry Board
Technical Areas	Small arms weapons and ammunition testing and performance.
Specialties	Planning, conducting, and reporting on service (user) type testing of small arms weapons, ammunition, components, and accessories.
Programs	M16A1 rifle; 40-mm grenade launchers (M203, DBCATA, M79) and their ammunition; AR-18 rifle; Future rifle and light machine gun; Day and night sights for small arms weapons; Sub-caliber devices for hand and shoulder fired small arms weapons.
Papers	Reports of service type tests of rifles, machine guns, grenade launchers, and their ammunition and ancillary equipment.
Remarks	Alternate contact would be the Chief, Small Arms Test Branch, and/or test project officers of Small Arms Test Branch. The Small Arms Test Branch maintains an almost complete file of reports of tests it has conducted going back to approximately 1956.
Descriptors	Field tests Grenade launchers Rifles Weapons tests

**Sheffield, Oliver E.**  
**Explosives Research Chemist**

**Commanding Officer**  
**Picatinny Arsenal**  
**ATTN: SMUPA-FR-E (Mr. Oliver E. Sheffield)**  
**Dover, NJ 07801**

**Autovon: 880-3386**  
**Telephone: (201) 328-3386**

<b>Technical Areas</b>	<b>Chemistry of explosives; Propellants and pyrotechnics; Ordnance materials.</b>
<b>Specialties</b>	<b>Explosives; Propellants; Pyrotechnics and related items; Sources of information; Information retrieval and dissemination.</b>
<b>Programs</b>	<b>Writing a 10-volume work entitled "Encyclopedia of Explosives and Related Items".</b>
<b>Papers</b>	<b>Numerous in-house technical reports: "Handbook on Foreign Explosives", "Properties of Explosives of Military Interest", "Effects of Materials on the Properties of Explosives". Encyclopedia of Explosives: Vol. 1 (1960); Vol. 2 (1962); Vol. 3 (1966); Vol. 4 (1969); Vol. 5 (1972); Vol. 6 (In Preparation).</b>
<b>Descriptors</b>	<b>Explosives Propellants Pyrotechnics</b>

Shelton, Henry R. (COL)  
Chief, Combat Material Division

Headquarters Department of the Army  
ATTN: DARD-DDC (COL. Henry R. Shelton)  
Washington, DC 20310

Autovon: 822-4585  
Telephone (202) OX 5-4585

Organization	Office of the Chief of Research and Development
Specialties	Background on development of ARSAP; M-16 controversy; Major Department of Army decisions on small arms, 1967-1972.
Programs	Special Purpose Individual Weapon; Future Rifle System; Army Small Arms Program.
Descriptors	Rifles Shoulder weapons

**Shindler, Charles E.**  
**Chemical Engineer**

**Commanding Officer**  
**Frankford Arsenal**

**ATTN: SMUPA-T5000 (Mr. Charles E. Shindler)**  
**Philadelphia, PA 19137**

**Autovon: 348-7171**  
**Telephone: (215) 831-7171**

<b>Organization</b>	<b>Manufacturing Technology Directorate</b>
<b>Technical Areas</b>	<b>Product and process engineering of small caliber ammunition.</b>
<b>Specialties</b>	<b>Propellant; Primers; Pyrotechnics (design, formulation, manufacture, loading and ballistic testing).</b>
<b>Programs</b>	<b>5.56 ammunition for M16A1 Rifle; Propellant plant modernization; Cartridge and propellant plant production trouble-shooting.</b>
<b>Papers</b>	<b>Papers and reports on special tests of 5.56mm ammunition.</b>
<b>Remarks</b>	<b>Alternate-Mr. Harry Penn</b>
<b>Descriptors</b>	<b>Ammunition Primers Propellant Pyrotechnics</b>

Smith Philip J.  
Manager, Prototype Production Branch

Commander  
Naval Ammunition Depot  
ATTN: Code 5063 (Mr. Philip J. Smith)  
Crane, IN 47522

Autovon: 482-1282  
Telephone: (812) 854-1282

Organization	Product Development Division Research and Development Department
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Technical Areas	Non-metallic components of ammunition, weapons, and special packaging.
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Specialties	Plastic design and fabrication of small arms ammunition components; Design and development of special packaging for rifles, pistols, launchers.
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Programs	EX 113 colored signals; M16 stack; single rifle packaging.
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Descriptors	Ammunition Material technology Packaging Plastics
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Smith, Robert C.  
Chief, Development Section IIIB

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-AD-D-W-4 (Mr. Robert C. Smith)  
Dover, NJ 07801

Autovon: 880-3980  
Telephone: (201) 328-3980

Organization	Warheads and Special Projects Branch Ammo Development Division Ammo Development and Engineering Directorate
Technical Areas	Design, test and evaluation of developmental area target munitions for hand-held and automatic grenade launcher weapon systems.
Specialties	Development of high explosive fragmentation and canister antipersonnel cartridges; High explosive-dual purpose (antipersonnel-antimateriel) cartridges; Light or smoke emitting pyrotechnic signaling-illuminating cartridges; Practice cartridges yielding impact signatures.
Programs	30mm and 40mm HE, dual purpose, canister pyrotechnic and practice cartridges for M79, M203 XM128, XM140 and Future Rifle System grenade launchers.
Papers	Papers on area target munitions for hand-held grenade launchers.
Descriptors	Antipersonnel ammunition Grenades High explosive ammunition Pyrotechnics



Sollott, Gilbert P. (Dr.)  
Branch Chief, Organic Chemistry Branch

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L6200 (Dr. Gilbert P. Sollott)  
Philadelphia, PA 19137

Autovon: 348-5444  
Telephone: (215) 831-5444

Organization	Chemistry Research Division Pitman-Dunn Laboratory
Technical Areas	Organic chemistry; Organometallic chemistry; Polymer chemistry.
Programs	Chemiluminescent materials; Organometallic combustion catalysis; Modified benzimidazole polymers; Soluble styrene polymers; Ferrocene chemistry of Groups III, IV and V elements.
Papers	Publications on the ferrocene chemistry of Groups III, IV and V elements; Arylation of ferrocene with hydrazines; chemiluminescence of lithium phosphides; Heat stabilizers for nitrocellulose film.
Remarks	Patents on the ferrocene chemistry of Groups III and IV elements, explosive pyrotechnic complexes of ferrocene and inorganic nitrates; Stabilizers for nitrocellulose film.
Descriptors	Organic chemistry Propellant chemistry

**Snopek, Robert G. (LTC)**  
**Munitions Staff Officer**

**Commanding Officer**  
**Headquarter U.S. Army Combat Developments Command**  
**ATTN: CDC-MS-U (Mr. Robert G. Snopek)**  
**Fort Belvoir, VA 22060**

**Autovon: 354-6624/1055**  
**Telephone: (703) 664-6624/1055**

<b>Organization</b>	<b>Munitions Division</b> <b>Material Systems Directorate</b>
<b>Programs</b>	<b>Small Arms Ammunition/Fuzes;</b> <b>40mm Ammunition (Ground Systems).</b>
<b>Remarks</b>	<b>Monitors ammunition development and</b> <b>product improvement programs. Staffs</b> <b>ammunition requirement documents.</b>
<b>Descriptors</b>	<b>Ammunition</b> <b>Fuzes</b>

Starling, James F.  
Mathematician

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLYD (Mr. James F. Starling)  
Eglin Air Force Base, FL 32542

Autovon: 872-4688/4689  
Telephone: (904) 882-4688/4689

Organization	Projectile, Incendiary and Selected Systems Analysis Branch Air Force Armament Laboratory
Technical Areas	Gun system effectiveness
Specialties	Mathematical modeling and system effectiveness.
Programs	AX Gun System; Credible Chase; DEFA Gun Study.
Papers	Alternate Contact-Gerald Solomon
Descriptors	Aircraft armaments Mathematical models Weapons effects

**Stiefel, Ludwig**  
**Chemist/Chemical Engineer**

**Commanding Officer**  
**Frankford Arsenal**  
**ATTN: SMUFA-J8100 (Mr. Ludwig Stiefel)**  
**Philadelphia, PA 19137**

**Autovon: 8-348-7212**  
**Telephone: (215) 831-7212**

<b>Organization</b>	<b>Munitions Development and Engineering Directorate.</b>
<b>Technical Areas</b>	<b>Small arms propellants, charge design, ammunition-gun interface, erosion, fouling, smoke and flash; Thermochemistry (combustion ignition, weapon exhaust gases); Ballistics behavior of propellants in closed bombs and guns.</b>
<b>Programs</b>	<b>Fouling and Erosion M16A1 Rifle; High Bulk Density Extruded Propellants 5.56mm and 7.62mm; Multi-purpose Propellant for Small Arms; Toxicity of Weapon Exhaust; Distributed Propulsion; Nitramine Propellant Combustion.</b>
<b>Papers</b>	<b>Papers, reports and presentations on above programs.</b>
<b>Descriptors</b>	<b>Ballistic tests Erosion Propellants Propellant chemistry</b>

Strickland, W. Stanley  
Project Engineer

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLRV (Mr. W. Stanley Strickland)  
Eglin Air Force Base, FL 32542

Autovon: 872-4655  
Telephone: (904) 882-4655

Organization	Vulnerability Assessments Branch Weapons Effects Division Air Force Armament Laboratory
Technical Areas	Terminal effects/Vulnerability assessments.
Specialties	40mm ammunition; Fire start capabilities testing techniques.
Programs	Vulnerability of gun tubes to penetrators.
Descriptors	Terminal effects Vulnerability Weapon effects Weapon tests

**Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-WS (Mr. John Struve)  
Aberdeen Proving Ground, MD 21005**

**Organization**

Programs	Future Rifle System; Serial Flechette Rifle; Multiple Flechette Rifle; Serial Bullet Rifle/ Full Bore, Sabot Bullet.
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Teitell, Leonard (Dr.)  
Chief, Microbiological Deterioration Group

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L6000 (Dr. Leonard Teitell)  
Philadelphia, PA 19137

Autovon: 348-6308  
Telephone: (215) 831-6308

Organization	Chemistry Research Division Pitman-Dunn Laboratory
Technical Areas	Industrial microbiology; Materials protection.
Specialties	Microbiological deterioration; Tropicalization.
Programs	Testing and advising on microbiological deterioration on many programs.
Papers	Reports on microbiological deterioration of ammunition and materials used in ammunition; Also reports on effects of tropical climate on ammunition.

Thilo, Edward R.  
Division Chief  
Physics Research Division

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-L4000 (Mr. Edward R. Thilo)  
Philadelphia, PA 19137

Autovon: 348-5929  
Telephone: (215) 831-5929

Organization	Pitman-Dunn Research Laboratory
Technical Areas	Penetration mechanics; Terminal ballistics; Interior ballistics; Launch ballistics.
Specialties	High speed radiography; Flechettes; Sabots; Mathematical modeling; Gas dynamics; Erosion; Photoelasticity; Launching techniques.
Programs	Bushmaster; Future Rifle System (FRS); WECOM 30; DESVAL; M16A1.
Papers	Papers in the general area of penetration per performance as a function of material and geometric shape; Math models to simulate interior ballistics; Extensive papers on photoelasticity, both dynamic and static.
Descriptors	Erosion Flechettes Gas dynamics Interior ballistics Launch ballistics Mathematical models Radiography Terminal ballistics Xray radiography



Thompson, Joseph F.  
Operations Research Analyst

Commanding Officer  
U. S. Army Small Arms Systems Agency  
ATTN: AMXAA-I, Bldg. 314 (Mr. J. F. Thompson)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-4623  
Telephone: (301) 278-4623

Organization	Industrial and Quality Assurance Division
Technical Areas	Ammunition Production Processes.
Programs	Serial Flechette Rifle Ammunition: Producibility, Production.
Papers	Evolution of the Sabot Design for the Serial Flechette Rifle.
Descriptors	Flechettes Sabots

Thompson, R. Stanley  
Chief, Crew Served Weapons Division

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S-DC (Mr. Stanley R. Thompson)  
Rock Island, IL 61201

Autovon: 793-6820  
Telephone: (309) 794-6820

Organization	Small Arms Weapons Systems Directorate Weapons Laboratory
Technical Areas	Automatic weapon design; Weapons dynamics Interior ballistics; Mechanism interface; Design techniques; Weapon system evaluation; System engineering.
Specialties	Component/System performance interface; Design requirement interface; Design feasibility; Design criteria; Probabilistic design; RAM/Design interface.
Programs	Squad Automatic Weapon; Armor Machine Gun.
Remarks	AOA Machine Gun Steering Committee Member; Machine Gun Coordination Group Member.
Descriptors	Machine guns Small arms design.

Thomsen, Darrel  
Mechanical Engineer

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-R (Mr. Darrel Thomsen)  
Rock Island, IL 61201

Autovon: 793-6745  
Telephone: (309) 794-6745

Organization	Weapons Laboratory
Technical Areas	Heat transfer
Specialties	Analytical studies in the prediction of transient weapon temperatures and experimental correlation testing.
Programs	Gun Barrel Technology; Gun Barrel Temperature; Profile Analysis; Gun Barrel Thermal Analysis and Experimental Correlation Studies; Aircraft Weapons (Gun Barrel Thermal and Structural Model.)
Papers	Papers on gun barrel heat transfer analysis, gun barrel thermal interface resistance, and barrel thermal testing results.
Descriptors	Gun barrels Heat transfer

**Titus, Joan**  
**Technical Writer**

**Commanding Officer**  
**Picatinny Arsenal**  
**ATTN: SMUPA-FR-M-D (Ms. Joan Titus)**  
**Dover, NJ 07801**

**Autovon: 880-2778**  
**Telephone: (201) 328-2778**

<b>Organization</b>	<b>Plastics Technical Evaluation Center (PLASTEC)</b> <b>Materials Engineering Division</b> <b>Feltman Research Laboratory</b>
<b>Technical Areas</b>	<b>Plastic materials suitable to small arms application.</b>
<b>Specialties</b>	<b>Rotating bands; Cartridge cases; Obturators; Weathering; Trade names; New plastics; Degradable plastics; Solid-phase (cold forming) plastics.</b>
<b>Programs</b>	<b>Rotating bands; Solid-phase forming; Degradable plastics.</b>
<b>Papers</b>	<b>"PLASTEC R42-Solid-Phase (Cold Forming) of Plastics"; "PLASTEC Special Report 9-New Plastics: Properties, Processing and Potential Uses"; "PLASTEC Special Report 10-Degradable Plastics for Mine Applications"; "PLASTEC Special Report 8-Plastic Rotating Bands: A Literature Search and Addendum 1".</b>
<b>Descriptors</b>	<b>Plastics</b> <b>Plastic cartridge cases</b> <b>Rotating bands</b>

Todaro, Donald G. (LCDR)  
Weapons Systems Manager For Combatant Craft

Commander  
Naval Ordnance Systems Command Headquarters  
ATTN: NORD-553B (LCDR Donald G. Todaro)  
Washington, DC 20360

Autovon: 222-7991/7992/7993  
Telephone: (202) 692-7991/7992/7993

Technical Areas	Machine guns (light, medium, heavy); Small arms; Fire control systems (small); Machine gun mounts (automatic and manual); Special warfare arms (Flame systems, Silent weapons, etc.).
Specialties	Overall management of concepts, specifications, development and production.
Programs	MK 30/0 30mm Lightweight Weapons System; MK 22/0 20mm Medium Machine Gun; MK 29/0 20mm Medium Machine Gun; Armament for Military Assistance Program (MAP) Craft.
Papers	Various papers for NAVORD Quarterly Bulletin, ASNE Journal, etc. on Combatant Craft Armament.
Descriptors	Machine guns

Trafton, Thomas R.  
Physical Scientist, Applied Ballistics Laboratory

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BIL (Mr. Thomas R. Trafton)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-3180  
Telephone: (301) 278-3180

Organization	Interior Ballistics Laboratory Ballistics Research Laboratory
Technical Areas	Interior ballistics; Propellants; Small arms ammunition; Thermodynamics.
Specialties	Mathematical models; Computer simulation.
Programs	Interior ballistics of small arms propellants
Papers	Papers on mathematical modeling of small arms ammunition and interior ballistics; Papers on pyrotechnic composition and performance; Erosion propellants.
Remarks	Contact Mr. Frankle, Branch Chief, as an alternate.
Descriptors	Computer simulation Interior ballistics Mathematical models Propellants

Upson, Harry W. (Jr.)  
Equipment Specialist (Ordnance)

Commanding General  
Headquarters U.S. Army Weapons Command  
ATTN: AMSWE-MAA-S (Mr. Harry W. Upson, Jr.)  
Rock Island, IL 61201

Autovon: 793-6496/4687  
Telephone: (309) 794-6496/4687

Technical Areas	Maintenance engineering; Publications; Programming.
Specialties	Maintainability in design; Development of maintenance and logistic support plans; Technical assistance to field and depots; Troubleshooting; Development of special tools; Parts authorization and levels of repair.
Programs	Small arms up to and including 20mm; Aircraft-peculiar types of weapons; Training devices; Depot coordination (overhaul).
Papers	Numerous papers on all aspects of weapons maintenance (small arms) as regards maintainability, logistics, depot support, field problems, modifications, man-power support requirements, etc.
Remarks	A broad knowledge of all small arms in the area of maintenance. General familiarity with all hand and shoulder fired weapons in the small arms group (rifles, pistols, revolvers, shotguns, etc.). Primary interest in automatic weapons (machine guns and automatic cannon).
Descriptors	Field maintenance Logistics management Maintainability Shop maintenance

Vaughan, Edwin M.  
Physical Scientist

Commanding General  
Headquarters U.S. Army Weapons Command  
ATTN: AMSWE-RDR (Mr. Edwin M. Vaughan)  
Rock Island, IL 61201

Autovon: 793-4649/4581  
Telephone: (309) 794-4649 /4581

Organization	Systems Research Division RD and E Directorate
Technical Areas	Barrel and cannon technology; Weapon mechanisms technology; Material sciences; Nuclear and radiation physics.
Specialties	Fatigue; Erosion; Fracture; Recoil; High-pressure physics; Cryogenics; Holography; Lasers; Fabrication; Blast and noise; Nuclear effects.
Programs	Future Rifle Systems; Squad Automatic Weapon; XM 204 Soft Recoil; Vulcan Air Defense; Cannon Launched Guided Projectile (CLGP); Low Altitude Forward Air Defense Systems; Gun Low Altitude Air Defense System; Advanced Automatic Aircraft, Gun XM140; TOW; MINT-TAT; "SEAS"; 155MM SP Howitzer M109A1; "8" SP Howitzer; M110E2; Lightweight Recoilless Antitank Weapons (SMAW <sup>1</sup> ); Lightweight Company Mortar (LWCM); IAMAS.
Descriptors	Erosion Fatigue (materials) Fracture properties Lasers Holography Recoil mechanisms



Vasilakis, John D. (Dr.)  
Mechanical Engineer

Director  
Watervliet Arsenal  
ATTN: SWEWV-RDR-AMM (Dr. John D. Vasilakis)  
Watervliet, NY 12189

Autovon: 974-5518  
Telephone: (518) 273-4610 Ext. 5518

Organization	Benet Research Laboratory
Technical Areas	Elastic/Plastic analysis of thick-walled tubes; Materials science.
Specialties	High strength alloys.
Programs	Testing of cylinders under rapid fire simulation.
Papers	"Inelastic Behavior of Thick-Walled Cylinders Subjected to Nonproportionate Loading" by S. C. Chu and J. D. Vasilakis; "Hi-Rate Loading of Barrels" by J. D. Vasilakis
Descriptors	Autofretting Materials technology

Virene, Edgar (Dr.)  
General Engineer

Commanding Officer  
U. S. Army Small Arms System Agency  
ATTN: AMXAA-I (Dr. Edgar Virene)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-4623  
Telephone: (301) 278-4623

Organization	Industrial and Quality Assurance Division
Technical Areas	Quality Assurance
Specialties	Reliability Analysis
Programs	Future Rifle System (FRS)
Papers	Reliability Growth Modeling; Kolmogorov-Smirnov Test for Goodness of Fit; Redundant Systems with Repair; Nonparametric Reliability; Application of Queueing Theory; Structural Reliability
Descriptors	Quality assurance Reliability

Visnov, Martin

Comanding Officer

U. S. Army Frankford Arsenal

ATTN: J8100, Bldg. 64-2 (Mr. Martin Visnov)

Philadelphia, PA 19137

Autovon: 348-6447/7224

Telephone: (215) 831-6447/7224

Organization

Propellant Development Branch  
Small Caliber Propellants and Pyrotechnics Division

Technical Areas

Solid propellants; homogeneous, composites

Specialties

Solid propellant chemistry; Combustion, Ignition; New compositions.

Programs

High energy propellants; Heat resistant propellants for caseless ammunition

Papers

Papers and presentations on new, high energy gun propellants, heat resistant propellants.

Descriptors

Solid propellants

Voreck, Wallace E.  
Chief, Sensitivity and Initiation Section  
Applied Physics Branch

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-EL-FRL (Mr. Wallace E. Voreck)  
Dover, NJ 07871

Autovon: 880-4533  
Telephone: (201) 328-4533

Organization	Explosive Laboratory Altman Research Laboratories
Technical Areas	Explosives; Detonators; Chemical engineering; Electronics
Specialties	Pilot plant synthesis of explosives; Explosive testing; Detonator and fuze train design; Nuclear radiation effects on explosives.
Programs	Developing new test methods for detonators (including stab sensitivity buildup to detonation, and output; Developing new detonator designs.
Papers	"Stab Sensitivity" PATR 4263, "Gamma Ray Gaging Detonators" PATR 4239, "Micro- scopic Examination of Explosives" PATR 4093, "Radiation Effects on Explosives" PATR 3782, "Plastic Bonded Explosives," etc.
Remarks	Professional Engineer
Descriptors	Detonators Explosives Explosive trains

Wallen, Stuvie C.  
Deputy Chief, Aircraft Weapons and Air Defense Systems

Commanding General  
Headquarters U.S. Army Weapons Command  
ATTN: SWERR-W (Mr. Stuvie C. Wallen)  
Rock Island, IL 61201

Autovon: 793-4155  
Telephone: (309) 794-4155

Organization	Weapons Laboratory
Technical Areas	Aircraft guns and gun systems.
Specialties	Gatling mechanisms; Gun barrel technology; Helicopter gun systems (including fire control).
Programs	20mm M61 Gun and Derivatives; Cheyenne Armament System; Huey Cobra Armament; General Army Aircraft Weaponry.
Remarks	Registered Professional Engineer.
Descriptors	Aircraft armaments Gatling mechanisms Gun barrels

Ward, John S.  
Mechanical Engineer

Commander  
Naval Weapons Laboratory  
ATTN: CODE 3015 (Mr. John S. Ward)  
China Lake, CA 93555

Autovon: 898-1700 Ext. 2505/2586  
Telephone: (714) 939-3505/2586

Technical Areas	Aircraft gun and ammunition design and testing.
Specialties	Ammunition design for 20mm through 40mm.
Programs	20mm Standard Service Round (SSR); Liquid Propellant Gun Ammunition.
Papers	"Final Summary Report 20mm Standard Service Round" NWC TP 5382.
Descriptors	Aircraft ammunition Liquid propellants

**Best  
Available  
Copy for the  
page below**

Webb, Jack B.  
Webb, Jack B.  
Supervisory Mechanical Engineer Technician  
Supervisory Mechanical Engineer Technician

Commanding Officer  
Commanding Officer  
Jefferson Proving Ground  
Jefferson Proving Ground  
ATTN: STEJP-1D-E (Mr. Jack B. Webb)  
ATTN: STEJP-1D-E (Mr. Jack B. Webb)  
Madison, IN 47250  
Madison, IN 47250

Autovon: 480-3240  
Autovon: 480-3240  
Telephone: (812) 273-1423, Ext. 5142  
Telephone: (812) 273-1423, Ext. 5142

Organization  
Organization  
Acceptance Test Branch  
Acceptance Test Branch  
Material Test Directorate  
Material Test Directorate

Technical Areas  
Technical Areas  
Ballistic testing of ammunition.  
Ballistic testing of ammunition.

Specialties  
Specialties  
Acceptance testing.  
Acceptance testing.

Programs  
Programs  
All components, 20mm thru 240mm.  
All components, 20mm thru 240mm.

Remarks  
Remarks  
Mr. Webb is a point of contact for  
Mr. Webb is a point of contact for  
inquiries concerning JPG testing operations.  
inquiries concerning JPG testing operations.

Descriptors  
Descriptors  
Acceptance tests  
Acceptance tests  
Ballistic tests  
Ballistic tests



White, Wilmer  
Chemical Engineer

Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-J8200 (Mr. Wilmer White)  
Philadelphia, PA 19137

Autovon: 348-5371  
Telephone: (215) 831-5371

Organization	Pyrotechnic Development Branch Munitions Development and Engineering Directorate.
Technical Areas	Small caliber ignition; Primers.
Specialties	Blank ammunition; Priming compositions.
Programs	Cartridge, 7.62mm, Blank, M82; No.34 Primer; Jet Flame Primer.
Papers	White, W. and Braun, F. E., "Preliminary Investigation of a Jet Flame Primer", FA Report No. R-2011, June 1971.
Descriptors	Blank ammunition Primers

Weir, Raymond H.  
Director, Small Arms Weapon Systems Directorate

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-S (Mr. Raymond H. Weir)  
Rock Island, IL 61201

Autovon: 793-5234 or 5414  
Telephone: (309) 794-5234 or 5414

Organization	Weapons Laboratory
Technical Areas	Weapons dynamics
Specialties	Technical management of small arms weapons development.
Programs	SPIW; XM19; M219 Machine Gun; M85 Machine Gun; M16A1 Rifle; XM174; XM175; SAW.
Descriptors	Small arms design Weapon dynamics

Wineholt, Emma M.  
Mathematician, Dynamics Branch

Director  
Aberdeen Research and Development Center  
ATTN: AMXRD-BIL (Mrs. Emma M. Wineholt)  
Aberdeen Proving Ground, MD 21005

Autovon: 870-3083  
Telephone: (301) 278-3083

Organization	Interior Ballistics Laboratory Ballistic Research Laboratory
Technical Areas	Analog and digital programming (FORTRAN) for math models: Interior ballistics, kinematics and dynamics of gun mechanisms; Automated data reduction.
Specialties	M139 20mm; M16A1 simulation.
Programs	M16A1 simulation.
Papers	Numerous BRL reports on above.
Descriptors	Computer simulation Interior ballistics Mathematical models

Winger, Jack  
Project Engineer

Commander  
Headquarters Armament Development and Test Center  
ATTN: AFATL-DLRV (Mr. Jack Winger)  
Eglin Air Force Base, FL 32542

Autovon: 872-4655  
Telephone: (904) 882-4655

Organization	Weapons Effects Division Air Force Armament Laboratory
Technical Areas	Terminal effects/Vulnerability assessment.
Specialties	Weapons effectiveness against vehicular targets (tanks, trucks, APC's).
Programs	Truck Vulnerability.
Remarks	Highly knowledgeable on vulnerability of foreign vehicles.
Descriptors	Target vulnerability Terminal effects Vulnerability

Wolff, Russell  
Chief, Chemical Processes Technology

Commanding General  
Headquarters U. S. Army Weapons Command  
ATTN: SWERR-R (Mr. Russel Wolff)  
Rock Island, IL 61201

Autovon: 793-5504  
Telephone: (309) 794-5504

Organization	Research Directorate Weapons Laboratory
Technical Areas	Electrodeposition; Metal finishing.
Specialties	Chromium plating (gun barrel bores); Phosphatizing; Anodizing.
Programs	4.32mm barrel development; M16 Rifle.
Papers	Several on electrodeposition.
Descriptors	Coatings Electrodeposition

## **SECTION II**

### **INFORMATION HANDLING ACTIVITIES**

Aberdeen Proving Ground  
Technical Library

Commanding Officer  
Aberdeen Proving Ground  
ATTN: STEAP-TL  
Aberdeen Proving Ground, MD 21005

Autovon: 234-3350 Ext. 3715/2125  
Telephone: (301) 278-3715

Point of Contact:	Forst, Rosalie, Chief, Technical Library Div.
Principal Subject Areas of Holdings:	Small arms ammunition; Test data; Ballistics.
Formats of Holdings:	Hardcopy; Microforms.
Services Provided:	Lending; Copying/Sending; Reference/Research; Bibliography compilation; Referrals.
Special Service Restrictions:	DOD and Contractors; Special approval required for access to some test records.
Remarks:	Library is a major resource for ordnance in- formation and monitors input of STINFO data. Special resources include 500,000 firing records and technical reports of MTD including those from Jefferson P. G., Sandy Hook (back to 1897) and Yuma P. G.
Descriptors:	Accuracy test data Ballistics Ballistics tests Cartridges Exterior ballistics Interior ballistics Proof test data Terminal ballistics

**Battelle Memorial Institute  
Columbus Laboratories**

505 King Avenue  
Columbus, OH 43201

Telephone: (614) 299-3151

**Principal Activities/  
Services of Facility:**

Contract and proprietary research and development in physical and social sciences. Technical answers and evaluation, materials R & D, information systems and services.

**General Technical  
Areas of Facility:**

Materials and processes research and development.

**Technical Specialties  
of Facility:**

Solid state bonding; Inorganic coatings; Melting and casting; Metalworking; Ceramic and graphite materials; Systems analysis and design.

**Information Resources:**

Technical experts; Scientific and technical library; Holdings of various information analysis centers.

**Size of Facility Staff:**

2600

**Special Service Restrictions:**

Some information resources are classified.

**Service Fee Basis:**

Varies with individual unit or division.

**Remarks:**

Individual activities are listed under Battelle Memorial Institute Metals and Ceramics Information Center, Copper Data Center, Defense Analysis and Technology Division, and Tactical Technology Center.



(cont'd)

Battelle Memorial Institute  
Columbus Laboratories

Descriptors:

Arc melting  
Bonding  
Coating processes  
Coatings  
Diagnostic systems  
Diffusion bonding  
Electron beam melting  
Explosive bonding  
Friction bonding  
Gas pressure bonding  
Induction melting  
Melting  
Plasma spraying  
Systems analysis  
Vapor deposition

**Battelle Memorial Institute  
Copper Data Center**

505 King Avenue  
Columbus, OH 43201

Telephone: (614) 299-3151

Parent Organization:	Battelle Memorial Institute
Other Sponsoring Organizations:	Copper Development Association
Point of Contact:	Black, William T., Director
Principal Products/ Programs of Parent Organization:	See listing-Battelle Memorial Institute, Columbus Laboratories.
Principal Subject Areas of Facility Holdings:	Copper; Copper alloy; Applications of materials competing with copper.
Types of Holdings:	Texts; Periodicals; Articles/Papers; Reports.
Formats:	Hardcopy; Computer Tapes.
Services to Outsiders:	Reference/Research; Bibliographies, Technical answers.
Size of Staff:	2 Professional; 2 Technical/Clerical
Service Fee Basis:	No charge.
Remarks:	Connected with Battelle Basis 70 computer system. Documents extracted and indexed. Terms from CDC Thesaurus.
Descriptors:	Materials technology

**Battelle Memorial Institute  
Defense Analysis and Technology Division**

**505 King Avenue  
Columbus, OH 43201**

**Telephone: (614) 299-3151**

<b>Point of Contact</b>	<b>Goddard, Stanley C.</b>
<b>Principal Products/ Programs of Parent Organization</b>	<b>see listing: Battelle Memorial Institute, Columbus Laboratories</b>
<b>General Technical Areas of Facility</b>	<b>Tactical weaponry; High speed Phenomena; Advanced weapons; Advanced systems components.</b>
<b>Technical Specialties</b>	<b>Systems analysis; Naval gunnery-small and large bore; Barrel erosion; Guided project- iles; Liquid propellant guns; Antitank weaponry; Special applications of fire control, radar, infrared, and fuzing technology 40mm rapid fire weapons.</b>
<b>Service Fee Basis</b>	<b>Negotiated</b>
<b>Remarks</b>	<b>Mr. Goddard is in the Engineering Physics Section of Battelle, Division staff interdisciplinary.</b>
<b>Descriptors</b>	<b>Antitank weapons Automatic weapons Erosion analysis Fire control systems Fuzes Liquid propellant guns Systems analysis Rapid fire weapons</b>

**Battelle Memorial Institute  
Metals and Ceramics Information Center**

**505 King Avenue  
Columbus, OH 43201**

**Telephone: (614) 299-3151**

<b>Parent Organization:</b>	<b>Battelle Memorial Institute</b>
<b>Other Sponsoring Organizations:</b>	<b>DoD, monitored by AMMRC</b>
<b>Point of Contact:</b>	<b>Moran, H. Dana, Director Rubin, Steve, Mgr. Information Operations</b>
<b>Principal Products/ Programs of Parent Organization:</b>	<b>See listing-Battelle Memorial Institute, Columbus Laboratories.</b>
<b>Principal Subject Areas of Facility Holdings:</b>	<b>Advanced metals and ceramics-high strength and high resistance.</b>
<b>Types of Holdings:</b>	<b>Texts; Periodicals; Articles/Papers; Reports.</b>
<b>Formats:</b>	<b>Hardcopy; Computer tapes.</b>
<b>Services to Outsiders:</b>	<b>Reference/Research; Bibliographies technical answers and evaluations.</b>
<b>Size of Staff:</b>	<b>5 Information Specialists</b>
<b>Services Fee Basis:</b>	<b>Billing through NTIS or arrangement with MCIC.</b>
<b>Publications Available to Requestors:</b>	<b>MCIC Newsletter; MCIC Reviews of Metals and Ceramics Technology-weekly, each on a particular MCIC subject area, through NTIS; MCIC State of the Art reports and handbook, through NTIS.</b>
<b>Remarks:</b>	<b>Connected with Battelle Basis 70 computer system. 100,000 documents, indexed and extracted in the system.</b>

(cont'd)

Battelle Memorial Institute  
Metals and Ceramics Information Center

Descriptors:

Ceramics  
Composite materials  
Metallurgy  
Metallurgical tests  
Metals  
Metal cutting  
Powder metallurgy

**Battelle Memorial Institute  
Tactical Technology Center (TACTEC)**

505 King Avenue  
Columbus, OH 43201 or  
1755 Massachusetts Avenue, N.W.  
Washington, DC 20036

Telephone: (614) 299-3151-Columbus  
(202) 232-8553-Washington, D.C.

Parent Organization:	Battelle Memorial Institute
Other Sponsoring Organizations:	DoD; ARPA
Points of Contact:	Brown, J. Tuck, Director (Columbus) Minckle, R. D., Director (Washington, DC)
Principal Products/ Programs of Parent Organization:	see listing-Battelle Memorial Institute, Columbus Laboratories.
Principal Subject Areas of Facility Holdings:	Tactical welfare; Weapons; Munitions; Armor; Logistics; Operations analysis; Surveillance; Communications; Socio- technical sciences; Ecological sciences.
Types of Holdings:	Texts; <del>Periodicals</del> ; Articles. Papers; Reports.
Formats:	Hardcopy.
Services to Outsiders:	Reference/Research; Bibliographies; Technical answers.
Size of Staff:	4 professional; 6-7 technical/clerical.
Special Service Restrictions:	Available to DoD agencies and contractors.
Service Fee Basis:	Negotiated
Remarks:	TACTEC operates under Battelle Tactical Systems and Technology Office, Joe Ray, Manager. Data base of 32,000 documents, indexed and extracted.
Descriptors:	Tactical warfare

Eglin Air Force Base  
Air Force Armament Laboratory  
Technical Library

Commander  
U. S. Air Force Armament Development Test Center  
ATTN: DLOS-L  
Eglin Air Force Base, FL 32542

Autovon: 872-3212  
Telephone: (904) 882-3212

Point of Contact:	Harvey, Virginia
Principal Subject Areas of Holdings:	Aircraft armaments; Ammunition; Development;
Formats of Holdings:	Hardcopy; Microforms
Services Provided:	Lending; Copying/Sending; References/ Research; Bibliographies prepared.
Size of Staff:	4 professional; 1 technical/clerical.
Special Service Restrictions:	Services only to base employees or to contractors with an active contract with the base.
Descriptors:	Aerodynamics Aircraft ammunition Aircraft armament Antiaircraft ammunition Fragmentation ammunition Gun sights High explosive ammunition High explosive incendiary ammunition Mechanical tests Semiautomatic weapons Vibration research Weapons mounts

Fort Ord  
CDEC Field Experimentation Data Bank

Commanding General  
Headquarters  
US Army Combat Developments Experimentation Command  
DCS Plans and Programs  
ATTN: CDCEC-PL-D  
Fort Ord, CA 93941

Autovon: 973-3255/3297

Telephone: (408) 242-3255/3297

Point of Contact: Colson, Robert (CPT)

Principal Subject Areas  
of Holdings: Infantry organizations, doctrine, and equipment;  
Comparative evaluations of selected small arms;  
Night observation devices.

Formats of Holdings: Hardcopy; Microforms; Computer tapes;  
Punch cards.

Services Provided: Copying/Sending; Reference/(DDC)

Size of Staff: 1 professional; 3 clerical.

Special Service Restrictions: U.S. Government agencies; others on need-to-know basis.

Publications Available  
to Requestors: Catalog of USACDEC Field Experimentation

Remarks: For information on specific small arms  
experiments, write for catalog.

Descriptors: Antipersonnel weapons  
Infantry



Fort Ord  
Technical Library

Commanding General  
Headquarters Combat Developments Command/  
Experimentation Command  
Technical Library, Box 22  
Fort Ord, CA 93941

Autovon: 973-242-2971  
Telephone: (408) 242-2971

Points of Contact:	Headley, Alva, Librarian
Formats of Holdings:	Hardcopy; Microforms.
Services Provided:	Lending; Copying/Sending; References/Research.
Size of Staff :	2 professional; 3 technical/clerical
Descriptors:	Logistics management Man-machine systems

**Frankford Arsenal  
Technical Library**

**Commanding Officer  
Frankford Arsenal  
ATTN: SMUFA-H1300  
Philadelphia, PA 19137**

**Autovon: 234-1800  
Telephone: (215) 831-6103**

<b>Points of Contact:</b>	<b>Lassanyi, Mary E.</b>
<b>Principal Subject Areas of Holdings:</b>	<b>Small caliber ammunition; Propellants; Antitank ammunition; Armor piercing ammunition.</b>
<b>Formats of Holdings:</b>	<b>Hardcopy; Microforms.</b>
<b>Service Provided:</b>	<b>Lending; Copying/Sending; Reference/Research.</b>
<b>Size of Staff:</b>	<b>2 professional; 6 technical/clerical.</b>
<b>Special Service Restrictions:</b>	<b>Govt. agencies and contractors with need to know and clearance.</b>
<b>Remarks:</b>	<b>Special collections on small arms, lasers, masers, guerrilla warfare, optics.</b>
<b>Descriptors:</b>	<b>Antitank ammunition Armor piercing ammunition Fire control components Lasers Propellants Small arms ammunition</b>

**Nondestructive Testing Information Analysis Center**

**Director**

**Army Materials and Mechanics Research Center**

**ATTN: NTLAC**

**Watertown, MA 02172**

**Autovon: 684-8384/552**

**Telephone: (617) 926-1900 Ext. 343, 552**

<b>Points of Contact:</b>	<b>Merhib, Charles (Technical)</b> <b>Taylor, Leon (Library Systems)</b>
<b>Principal Subject</b> <b>Areas of Holdings:</b>	<b>All aspects of nondestructive testing.</b>
<b>Formats of Holdings:</b>	<b>Hardcopy; Termatrix System (see remarks below)</b>
<b>Service Provided:</b>	<b>Limited Reference/Research; Referrals; Bibliography and abstract preparation.</b>
<b>Publications Available to Requestors:</b>	<b>Newsletter and Report Guides (Annotated bibliographic abstracts).</b>
<b>Remarks:</b>	<b>Termatrix coordinate indexing system. used for storage/retrieval. Presently can index 10,000 items by 650 descriptors.</b>
<b>Descriptors:</b>	<b>Nondestructive testing</b>

Picatinny Arsenal  
Scientific and Technical Information Branch (STINFO)

Commanding Officer  
Picatinny Arsenal  
ATTN: SMUPA-RT-S (Building 59 )  
Dover, NJ 07801

Autovon: 880-2914  
Telephone: (201) 328-2914

Point of Contact:

Costello, Michael A., Library Administrator,  
Branch Chief.

Principal Subject  
Areas of Holdings:

Ammunition (antipersonnel); Engineering  
technology; Nuclear weapons; Ballistics;  
Explosives; Propellants; Pyrotechnics.

Formats of Holdings:

Hardcopy; Microforms.

Services Provided:

Lending; Reference/Research; Translations.

Size of Staff:

7 professional; 12 technical/clerical;  
1 technical pub. writer-editor; 1 translator.

Special Service  
Restrictions:

DoD Employees and contractors.

Publications Available  
to Requestors:

Technical Information Bulletin (Weekly) to  
DoD organizations only.

Descriptors

Antipersonnel ammunition  
Ballistics  
Detonators  
Explosives  
Propellants  
Pyrotechnics

Rock Island Arsenal  
Technical Library

Commanding General  
Headquarters, U.S. Army Weapons Command  
ATTN: SWERR-PL (Technical Library)  
Rock Island, IL 61201

Autovon: 793-5031/5267  
Telephone: (309) 794-5031/5267

Points of Contact:	Meredith, Ruth, Librarian
Principal Subject Areas of Holdings:	Weapons systems and components; Cost effectiveness; Mounts; Recoil mechanisms; Gun loaders; Antitank weapons; Antiaircraft weapons; Metal cutting; Corrosion prevention.
Formats of Holdings:	Hardcopy; Microforms.
Service Provided:	Lending; Reference/Research.
Size of Staff:	1 professional; 5 technical/clerical.
Special Service Restrictions:	DoD agencies and contractors.
Remarks:	Services to outsiders provided within limits of staff.
Descriptors:	Antiaircraft weapons Antitank weapons Corrosion inhibitors Friction wear Gun feed mechanisms Lubricants Metal cutting Recoil mechanisms Weapon mounts

Watervliet Arsenal  
Benet Weapons Laboratory  
Technical Information Services Office

Director  
Benet Weapons Laboratory  
ATTN: SWEWV-RDT-L  
Watervliet, NY 12189

Autovon: 974-4610  
Telephone: (518) 273-4610

Point of Contact:	Vrooman, George K., Chief, Technical Library
Principal Subject:	Materials technology; Weapons research and development.
Areas of Holdings:	
Formats of Holdings:	Hardcopy; Microforms.
Services Provided:	Lending; Copy/Sending; Reference/Research; Referral.
Size of Staff:	1 professional; 6 technical/clerical.
Special Service Restrictions:	Services provided to government agencies and their contractors with need to know and clearance.
Descriptors:	Barrel erosion Composite materials Corrosion Corrosion analysis Materials technology Metallurgy

**SECTION III**

**INDUSTRIAL SOURCES**

AAI Corporation,  
(United Industrial Corporation)

P.O. Box 6767  
Baltimore, MD 21204

Telephone (301) 666-1400

Point of Contact

Irwin R. Barr, Vice President and Director,  
Weapons and Aero Systems Division

Principal Products

R&D and production for the Department of Defense. Automatic test equipment; Training and simulation; Weapons; Materials handling; Law enforcement products. Weapons and Aero Systems Division manages R&D and production in areas basically non-electronic.

Technical Areas

Gun and ammunition design and development; Interior and exterior ballistics; Effectiveness analysis; Testing; Structural analysis; Fuzing; Safing and arming sights; Test instrumentation; Machine design; Facility automation; High explosive research and explosive train design; Heat transfer analysis and test; Pyrotechnics.

Information Resources

Technical library; Computerized data bank and programs.

Remarks

Facility is designed to accomplish complete small arms ammunition and weapon design, development and testing functions with computerized analysis. Manufacturing facilities, test ranges, Multi-flash x-ray and high-speed instrumentation.

Descriptors

Explosive trains  
Explosives  
Exterior ballistics  
Fuzes  
Interior ballistics  
Pyrotechnics  
Small arms design  
Weapon systems  
Weapons



**Aluminum Company of America  
Application Engineering Division**

**Box 772  
New Kensington, PA**

**Telephone: (412) 339-6651**

<b>Point of Contact</b>	<b>Johnson, Edsel W., Staff Engineer</b>
<b>Principal Products:</b>	<b>Aluminum mill products (sheet, plate, rod, tube, extrusions, etc.) and engineered products (cartridge case cups and discs, forgings, premium castings, etc.)</b>
<b>Principal Services:</b>	<b>Technical support to aluminum users, particularly at design and development stages.</b>
<b>Technical Areas:</b>	<b>Characteristics of aluminum alloys, tempers, product forms and processing (finishing, joining, metalworking, etc.)</b>
<b>Technical Specialties:</b>	<b>Aerospace and military equipment; Transportation; Consumer durables; Machinery and equipment.</b>
<b>Information Resources:</b>	<b>Library of Alcoa Research Labs.</b>
<b>Remarks:</b>	<b>Principal supplier of aluminum in various alloys and product forms for cartridge case development programs. Investigation of problems with aluminum parts on the M16 rifle.</b>
<b>Descriptors</b>	<b>Cartridge cases</b>

**Amron Corporation**  
**(Weatherby NASCO Inc.)**

**525 Progress Ave**  
**Waukesha, WI 53186**

**Points of Contact**

**Mr. Kenneth V. Tapper, President**  
**Mr. W. John Woodruff, Technical Director**  
**Mr. Ralph Kelly, Vice President, Contracts**

**Principal Products:**

**Military ammunition components (20mm-40mm)**

**Technical Areas:**

**Metal forming technology; Blank cup and draw method to manufacture cases and projectiles;**  
**Surface protection coatings (zinc/anozinc, phenolic varnishes and oth. r organic coatings)**

**Technical Specialties:**

**Steel; Aluminum and brass cartridge cases for high performance (pressure, velocity, and/or cyclic rate) cannon; Industrial quality control.**

**Descriptors:**

**Ammunition**  
**Cartridge cases**  
**Coatings**  
**Projectiles**

**Ares, Inc.**

**P. O. Box 159  
Erie Industrial Park  
Port Clinton, OH 43452**

**Telephone: (419) 635-2343**

**Ponts of Contact:**

**Stoner, Eugene M., Consultant  
Bihun, Robert G., Engineering Manager**

**Principal Products:**

**Prototype ordnance related mechanisms.**

**Principal Services:**

**Small arms and larger caliber weapon systems; Design and development; Prototype manufacture; Test ranges; Weapon system consultation services; Producibility studies.**

**Technical Areas:**

**Analytical studies; Hardware development; Testing; Small arms; Automatic cannons; Feed systems; Mounts; Command stations.**

**Technical Specialties:**

**Prototype hardware development and manufacture; Test facilities, to include: two (2) 100 meter indoor firing ranges (up to 35mm capability), access to adjoining 1500 meter outdoor land impact test area and access to adjoining 12,000 meter outdoor water impact test area.**

**Descriptors:**

**Ballistic tests  
Gun feed mechanisms  
Mounts  
Small arms design**

**AVCO Corporation,  
AVCO Precision Products Division**

**Sheridan Street  
Richmond, IN 47374**

**Telephone: (317) 962-5511**

**Points of Contact:**

**Rayle, Roy E., Director, Projectiles & Grenades  
Brown, M. D., Director, Marketing Research  
Mertens, W. J., Engineering Manager  
Smith, W. G., Engineering Manager  
Cleaver, A. L., Engineering Manager**

**Principal Products:**

**Products: 20mm, 25mm, 30mm, and 40mm  
projectiles; Aircraft gun mounts (40mm/105mm).  
Programs: Development and production of  
ammunition for 40mm M79 launcher; Development  
20mmAPI/SAPI; Development 30mm WECOM  
ammunition; Development & production ammunition  
for 40mm M75/M129 launchers; Development 25mm  
GAU-7; Development 25mm Bushmaster; Development  
rocket-boosted 40mm rounds.**

**Principal Services:**

**Research, development and production of frag-  
menting munitions (including bomblets, projectiles,  
mines, and grenades) proximity fuzes, rocket-  
boosted projectiles, armor-defeating projectiles,  
gun mounts, and safety and arming devices for  
missile warheads. Main plant 1,000,000 sq. ft.  
floor space. Loading and testing facilities -  
180 acres.**

**Technical Areas:**

**Munition design and systems analysis, including  
interior, exterior and terminal ballistics through  
use of IBM 1130. Production engineering and  
production of wide range of munitions for Army,  
Navy, and Air Force. Design of gun mounts and  
weapon mechanisms.**

**Technical Specialities:**

**Development and production of munitions involving  
unique fabrication processes where grenades or  
projectiles are coined, cupped and drawn, extruded,  
or machined.**

**AVCO Corporation,  
AVCO Precision Products Division - (cont'd)**

**Information Resources:**           **Extensive technical library available.**

**Remarks:**                   **Main emphasis on munitions development, but also associated in development of 30mm and 40 mm grenade launcher mechanisms. Development of gun mounts for the Air Force in 40mm and 105mm size has been conducted for Patterson AFB over the past 4 years. Rocket-boosted rounds have been developed both in-house and under contract in sizes ranging from 15mm thru 40 mm.**

**Descriptors:**               **Ammunition  
Exterior ballistics  
Gun mounts  
Interior ballistics  
Terminal ballistics  
Weapon fabrication**

**Battelle Memorial Institute  
Columbus Laboratories**

**505 King Avenue  
Columbus, OH 43201**

**Telephone: (614) 299-3151**

**Principal Activities/  
Services of Facility:**

**Contract and proprietary research and development in physical and social sciences. Technical answers and evaluation, materials R & D, information systems and services.**

**General Technical  
Areas of Facility:**

**Materials and processes research and development.**

**Technical Specialties  
of Facility:**

**Solid state bonding; Inorganic coatings; Melting and casting; Metalworking; Ceramic and graphite materials; Systems analysis and design.**

**Information Resources:**

**Technical experts; Scientific and technical library; Holdings of various information analysis centers.**

**Size of Facility Staff:**

**2600**

**Special Service Restrictions:**

**Some information resources are classified.**

**Service Fee Basis:**

**Varies with individual unit or division.**

**Remarks:**

**Individual activities are listed under Battelle Memorial Institute Metals and Ceramics Information Center, Copper Data Center, Defense Analysis and Technology Division, and Tactical Technology Center.**

**Battelle Memorial Institute  
Columbus Laboratories**

**(cont'd)**

**Descriptors:**

**Arc melting  
Bonding  
Coating processes  
Coatings  
Diagnostic systems  
Diffusion bonding  
Electron beam melting  
Explosive bonding  
Friction bonding  
Gas pressure bonding  
Induction melting  
Melting  
Plasma spraying  
Systems analysis  
Vapor deposition**

**The Bellmore-Johnson Tool Co.**

**445 Putnam Avenue  
Hamden, CT 06517**

**Telephone: (203) 248-5551**

**Points of Contact:**

**Hillberg, Robert, Chief Design Engineer  
Findlay, David, Government Sales Manager.**

**Principal Products:**

**Tools, gages, dies, fixtures for military and commercial arms design; Engineering development, prototype fabrication and production of military, commercial and law enforcement arms products.**

**Principal Services:**

**Concept development; Engineering development; Prototype fabrication and preliminary production.**

**Technical Areas:**

**Arms design; Development engineering; Prototype model shop and production shop of both gun components and complete systems.**

**Technical Specialities:**

**Innovative designs of commercial and law enforcement equipment; Production of components for current U. S. Army small arms systems; Expert witness service and design consulting service.**

**Descriptors:**

**Hand guns  
Shot guns  
Small arms design**



**Borg-Warner Corporation  
Spring/Brummer Division**

**700 South 25th Avenue  
Bellwood, IL 60104**

**Telephone: (312) 544-2600**

**Points of Contact:**

**Ferris, Ernie A., Vice President and  
Director of Engineering; Geis, James E.,  
General Sales Manager; Romig, Charles,  
Sales Representative; Morrow, Tod O.,  
Industrial Sales Manager.**

**Principal Products:**

**Ammunition links; Clips and magazines;  
Overrunning clutches and other power trans-  
mission components; Friction materials;  
Seals; Custom steel stampings; Rubber  
and plastic molding.**

**Principal Services:**

**Large volume production of precision com-  
ponents and assemblies; Manufacturing  
feasibility studies.**

**Technical Areas:**

**Large volume precision heat treated  
stampings; Rubber and plastic molded  
components.**

**Technical Specialties:**

**Large volume precision heat treated  
stampings; Rubber and plastic molded  
components.**

**Descriptors**

**Aircraft armament  
Belt links  
Magazines (ammunition)  
Plastics**

**Brunswick Corporation  
Technical Products Division**

**Route 1, Box 300  
Sugar Grove, VA 24375**

**Telephone: (703) 677-3111**

**Point of Contact:**

**Green, Charles, Manager, Engineering**

**Principal Products**

**25mm caseless ammunition; Design;  
Development and production.**

**Technical Areas**

**Ordnance; Pyrotechnics; Explosives.**

**Technical Specialties**

**Combustible fibers; Molded propellants;  
Ammunition design; Testing and production.**

**Descriptors**

**Ammunition  
Caseless ammunition  
Explosives  
Propellants  
Pyrotechnics**

**The Budd Company  
Technical Center**

**300 Commerce Drive  
Fort Washington, PA 19034**

**Telephone: (215) 643-2950**

<b>Points of Contact:</b>	<b>Zettlemoyer, Earl A., Sales Manager, Ordnance; Dickhart, William W., Marketing Manager</b>
<b>Principal Products:</b>	<b>Automotive stampings; Frames; Brakes; Wheels; Trailer manufacture; Plastic products.</b>
<b>Principal Services:</b>	<b>Research and development; Design and proto- type manufacturing.</b>
<b>Technical Areas:</b>	<b>Metal forming; Joining; Finishing; Testing; Analyzing; Plastic tooling and fabrication.</b>
<b>Technical Specialties:</b>	<b>Have extensive background in design, development, testing and manufacturing ammunition. Shaped charge expertise has been developed over the past 20 years.</b>
<b>Information Resources:</b>	<b>Internal technical library only.</b>
<b>Descriptors:</b>	<b>Ammunition Plastics Explosives</b>

**Bulova Watch Company, Inc.**  
**Systems and Instruments Division**

**Sunrise Highway & Green Acres Road**  
**Valley Stream, NY 11582**

**Telephone: (516) 561-2600**

<b>Points of Contact:</b>	<b>Leddy, James, Asst. General Manager;</b> <b>Caruso, Rocco, Manager, Engineering;</b> <b>Eneman, Melvin, Manager, Advanced Development;</b> <b>Margulies, Irving, Manager, Special Services Dept;</b> <b>Nystrom, Roy, Manager, Ordnance Dept.</b>
<b>Principal Products:</b>	<b>Timing mechanisms.</b>
<b>Principal Services:</b>	<b>R&amp;D, Manufacturing and testing of electro-</b> <b>mechanical missile S/A's; Fuzes and timing</b> <b>devices.</b>
<b>Technical Areas:</b>	<b>Analysis; Design; Manufacturing; Testing and</b> <b>documentation of electro-mechanical devices.</b>
<b>Technical Specialities:</b>	<b>Design and analysis of mechanisms including</b> <b>timing mechanisms, particularly for safety</b> <b>interlocking and explosive train arming under</b> <b>very broad ranges of environments. Environ-</b> <b>mental testing, particularly high spin rate</b> <b>environments to 50,000 rpm. Design and</b> <b>manufacture automated testing and assembly</b> <b>equipment for fuzes and semi-conductor</b> <b>handling machines.</b>
<b>Descriptors:</b>	<b>Escapements</b> <b>Explosive Trains</b> <b>Fuzes</b>

**Calspan Corporation (formerly Cornell  
Aeronautical Laboratory, Inc.)**

**4455 Genesee Street  
Buffalo, NY 14221**

**Telephone: (716) 632-7500**

**Points of Contact**

**Sterbutzel, Gerald, Head, Thermal Research  
Branch, Systems Research Department  
Vassallo, Frank, Principal Research Engineer**

**Principal Products**

**Research and development in a variety of areas  
including aerospace, transportation, electronic  
weapon systems, etc.**

**Principal Services**

**In weapons related areas, both experimental and  
analytical R&D directed toward guns and  
ammunition.**

**Technical Areas**

**Interior and exterior ballistics; Special  
thermal instrumentation; Thermal analyses;  
Materials applications; Computer modeling  
of gas dynamic and combustion processes;  
Impartial evaluation of competitive systems;  
Cook-off and fire research; Coatings for thermal  
and environmental protection.**

**Technical Specialities**

**Special thermal instrumentation for gun chambers  
and barrels, and application of computer  
techniques to gun problems.**

**Descriptors**

**Ballistics tests  
Coatings  
Exterior ballistics  
Gas dynamics  
Heat transfer  
Interior ballistics  
Thermodynamics**

**Colesco Industries Inc.**  
**Missile and Space Division**  
**(Formerly: Missile Systems Division**  
**of Atlantic Research Corporation)**

**3333 Harbor Boulevard**  
**Costa Mesa, CA 92626**

**Telephone: (714) 546-8030**

**Points of Contact:** Jacobson, Gerson M., Manager, Special Weapons;  
Baker, Alan C., Staff Assistant, Ordnance Systems

**Principal Products:** Aerospace, environmental and industrial products.

**Principal Services:** Tactical weapons; Pyrotechnics and explosive  
devices; Ordnance; Space hardware and  
instrumentation; Targets; simulation;  
(Concepts, R&D, production for above).

**Technical Areas:** Mechanical and electrical engineering;  
Aerothermodynamics, propulsion and systems  
integration; Materials technology (Reinforced  
plastic foam-filled structures); Computer  
simulation; Systems engineering.

**Technical Specialties:** Grenade munition development: Warheads,  
training rounds, launchers. Free flight rocket  
systems: Anti-personnel, anti-materiel,  
anti-tank. Conventional, aero-ballistic ordnance  
systems: R&D through production. Glide vehicle  
technology and systems integration.

**Remarks** Individual staff members have extensive experience  
in development of small arms weapon systems  
and explosive ordnance munitions.

**Descriptors** Antimateriel weapons  
Antipersonnel weapons  
Antitank weapons  
Explosives  
Grenade launchers  
Plastics  
Pyrotechnics  
Targets

**Chamberlain Manufacturing Corporation  
Research and Development Division**

**East Fourth and Esther Streets  
Waterloo, IA 50705**

**Telephone: (319) 232-6541**

<b>Point of Contact</b>	<b>Bergstrom, John J., General Manager, Research and Development Division.</b>
<b>Principal Products</b>	<b>Base producer of artillery ammunition, bombs and non-nuclear warheads; and steel and aluminum products.</b>
<b>Principal Services</b>	<b>Research and development of ordnance items; Empirical analysis; Design; Process develop- ment; Product and production engineering; Testing; Data processing.</b>
<b>Technical Areas</b>	<b>Mechanical engineering; Industrial processes; Brazing and welding; Cold forming; Shock wave studies; Design automation; Extrusion and drawing; Fabrication metallurgy; Forging, and hot working; Grinding and polishing; Machining; Spinning; Stamping and coining; Data reduction and evaluation; Vulnerability study; Test and evaluation; Terminal ballistics; Fragmentation; Interior and exterior ballistics.</b>
<b>Technical Specialites</b>	<b>Artillery projectiles, 40mm through 8 inch; Improved conventional munitions (ICM); Grenades; Mines; Non-nuclear warheads; Bombs; Fuzes; Surface and air-launched munitions; Mine-laying equipment; Testing techniques; Levered machines</b>
<b>Descriptors</b>	<b>Ammunition Exterior ballistics Fuzes Gronades Interior ballistics Metallurgy Terminal ballistics</b>

**Chrysler Corporation  
Chrysler Defense Engineering**

**P.O. Box 1316  
Detroit, MI 48231  
Dept. 6127, Cims 424-04-23**

**Telephone: (313) 539-3000**

<b>Point of Contact</b>	<b>Suchocki, Anthony, J., Department Supervisor, Armament</b>
<b>Principal Products:</b>	<b>Military vehicles, M60 series tanks; Production.</b>
<b>Principal Services:</b>	<b>Engineering agency for M60 series vehicles in production; Field usage and product improvements.</b>
<b>Technical Areas:</b>	<b>Armament systems on combat vehicles.</b>
<b>Technical Specialties:</b>	<b>Mounts; Recoil mechanisms; Feed and ejection systems for machine guns, M85, M2 M37, M1919A4, M60, M219 and Bushmaster; Boresight adjustments; Fume evacuation; Large capacity ready ammunition boxes.</b>
<b>Descriptors</b>	<b>Armor Gun feed mechanisms Recoil mechanisms Weapon mounts</b>



**Colt Industries Operating Corp.,  
Firearms Division**

**150 Huyshope Avenue  
Hartford, CT 06102**

**Telephone: (203) 278-8550**

**Points of Contact:** Kelley, John P., Marketing/Sales;  
Costello, Richard L., Manager, Engineering Services

**Principal Products:** Manufacture of small arms for commercial  
and ordnance applications.

**Principal Services:** R&D, Product engineering; Small arms  
manufacture.

**Technical Areas:** Small mechanism design.

**Technical Specialties:** Small mechanism design.

**Descriptors:** Small arms design  
Weapon fabrication

**E. I. duPont de Nemours & Co., Inc.,  
Elastomer Chemicals Department**

**P. O. Box 406  
Wilmington, DE 19898**

**Telephone: (302) 999-3669/3660**

<b>Point of Contact</b>	<b>McEvoy, John J., Market Development Engineer</b>
<b>Principal Products:</b>	<b>Synthetic elastomers such as neoprene, urethane (ADIPRENE), fluorocarbon (VITON), and polyester (HYTREL) types; Related chemicals including organic isocyanates used in preparing urethane coatings.</b>
<b>Principal Services:</b>	<b>Technical advice on suitability and design considerations pertinent to the use of above materials.</b>
<b>Technical Areas:</b>	<b>Elastomer processing and testing.</b>
<b>Information Resources:</b>	<b>Technical data relating to performance characteristics of elastomers.</b>
<b>Remarks:</b>	<b>Modern synthetic elastomers including a broad range of materials of varying hardnesses; the higher modulus polymers are frequently employed in dynamic applications where impact resistance is critical.</b>
<b>Descriptors:</b>	<b>Chemicals Coatings Plastics</b>

E. I. duPont de Nemours & Co., Inc.,  
Fluorocarbons Div., Plastics Dept.

Room D-13185  
Wilmington, DE 19898

Telephone: (302) 774-8072/ 2860

Point of Contact:	Allen, David B., Special Technical Representative-Government
Principal Products:	<u>Teflon</u> fluorocarbon resins and films; <u>Tefzel</u> fluoropolymer resins and films.
Principal Services:	Technical assistance on suitability and design considerations pertinent to the use of <u>Teflon</u> and <u>Tefzel</u> as a material or in finished part form.
Technical Areas:	Research, development and manufacturing of fluorocarbon/fluoropolymer resins; design, testing and processing of items made from these resins.
Information Resources:	Technical data relating to performance characteristics of fluorocarbons and fluoropolymers.
Remarks:	Because of their unusual thermal and mechanical properties coupled with unique chemical inertness, the fluorocarbons are used in processing of ammunition, as additives for ammunition and as a casing or rotating band.
Descriptors:	Special applications materials

E. I. duPont de Nemours & Co., Inc.,  
Plastics Department

Wilmington, DE 19898

Telephone: (302) 774-4594

Point of Contact	Darden, E. T., Technical Representative (Plastics)
Principal Products:	<u>Zytel</u> nylon resins (including glass-reinforced); <u>Delrin</u> Acetal resins (including glass-reinforced).
Principal Services:	Plastics: design, processing, testing, special formulation.
Information Resources:	Technical data relating to processing and performance.
Remarks:	Wide range of properties obtainable through selection of base resin, additives, and glass reinforcement. Special development work under- taken on basis of potential sales volume and probability of success.
Descriptors:	Plastics Resins

**Federal Cartridge Corporation**  
**9th and Tyler**  
**Anoka, MN 55303**

**Telephone: (612) 421-7100**

**Point of Contact:** **Swanson, Roy, Vice President, Administration**

**Principal Products:** **Small arms ammunition: Sporting, center fire, rim fire and shotgun.**

**Principal Services:** **Manufacture small arms ammunition .**

**Technical Areas** **Production of small caliber ammunition.**

**Information Resources:** **Technical library primarily concerning manufacturing technology, principally for internal use.**

**Remarks:** **Federal Cartridge Corp. operates the Twin Cities Army Ammunition Plant.**

**Descriptors:** **Ammunition**

**General American Transportation Corporation,  
General American Research Division, Defense Systems**

**7449 North Natchez Avenue  
Niles, IL 60648**

**Telephone: (312) 647-9000**

<b>Points of Contact</b>	<b>Stern, R. E. , Program Manager, Defense Systems; Stewart, P. E. , Senior Engineer, Defense Systems; Volpe, V. F. , Group Leader, Electromechanical Design.</b>
<b>Principal Products:</b>	<b>Design, develop and produce a wide variety of ammunition, automatic weapons, munitions, aircraft stores and support equipment.</b>
<b>Principal Services</b>	<b>Division performs advanced research, engineering, and design Application engineering.</b>
<b>Technical Areas</b>	<b>Automatic weapons; Closed breech and recoilless launchers; Missiles and rockets; Special purpose warheads; CB protective shelters and vehicles; Propellant/explosive-actuated devices; Aircraft countermeasure systems.</b>
<b>Remarks</b>	<b>Facility owns and operates ballistic test station in Colorado for field evaluation of defense system items being developed.</b>
<b>Descriptors</b>	<b>Ammunition Automatic weapons Breech mechanisms Explosives Propellants</b>

**General Electric Company  
Armament Systems Department**

**Lakeside Avenue  
Burlington, VT 05401**

**Telephone: (802) 658-1500**

**Point of Contact:**                      **Wolvington, K. H. , Manager, Marketing  
and Advance Programs**  
**Rundle, D. B. , Manager, Sales**

**Principal Products:**                      **Armament systems.**

**Principal Services:**                      **Applied research; Design; Development;  
Manufacture; Testing.**

**Technical Areas:**                      **Gun system design.**

**Technical Specialties:**                      **Design and manufacture of high rate gun and  
ammunition handling systems supporting  
technologies in ammunition, materials,  
simulation and analysis.**

**Information Resources:**                      **General Electric "Technical Information  
Series" (TIS) Documents, Class 1.**

**Descriptors:**                      **Ammunition  
Gatling guns  
Weapon fabrication**

**General Motors Corporation,  
Delco Electronics Division**

**6767 Hollister Avenue  
Goleta, CA 93017**

**Telephone: (805) 968-1011**

**Points of Contact:**

**Gehring, J.W., Sr. Scientific Staff;  
Plumer, R.D., Head, Ordnance and  
Instrumentation Dept.**

**Principal Products:**

**R&D ordnance systems; Undersea exploration;  
Navigation systems; Electronic systems and  
aerophysics research.**

**Principal Services:**

**Basic and applied research studies; Design and  
testing; Field servicing; Hardware manufacture.**

**Technical Areas:**

**Small arms design and test; Special ordnance  
devices; Bombs; Fuzes; Land mine and high  
explosive devices.**

**Technical Specialties:**

**Special and unique ordnance devices; Advanced  
concept small arms; Special ammunition including  
caseless ammunition; Systems engineering.**

**Descriptors:**

**Ammunition  
Caseless ammunition  
Fuzes  
High explosives  
Small arms design  
Weapon fabrication**



**Gulf + Western Industries, Inc.,  
Gulf + Western Advanced Development  
and Engineering Center**

**101 Chester Road  
Swarthmore, PA 19081**

**Telephone: (215) 544-7600**

**Points of Contact:**

**Connor, Mark J., Manager, Light Automated  
Machinery Systems**

**Weiss, Melvin I., Chief Engineer**

**Principal Products:**

**Development engineering services to government  
and industry: Develop, produce, market and  
support certain categories of engineering-inten-  
sive products including small arms ammunition  
machinery.**

**Principal Services:**

**R&D metalforming and metalforming equipment;  
Ammunition manufacturing; Consultation services  
in tooling; Annealing; Inspection techniques  
Development of special purpose presses.**

**Technical Areas:**

**Metalforming; Analytical; Equipment development;  
Systems management.**

**Technical Specialties:**

**1200/Min. Cartridge, ball and tracer bullet  
production systems (5.56mm thru .30 cal.);  
600/Min., propellant loading system (.50 cal.  
thru 30mm).**

**Descriptors:**

**Cartridge cases**

**Heinrich von Wimmersperg, Consultant**

**15929 Grand River Avenue  
Detroit, MI 48227**

**Telephone: (313) 838-9320  
(313) 837-2392**

**Point of Contact**

**Von Wimmersperg, Heinrich, Development  
Engineer, Consultant.**

**Principal Services:**

**Design and consulting work in development of  
automatic firearms: pistols, submachine guns,  
special-forces guns, light machine guns, vehicle  
guns, 20mm guns, sear mechanisms, magazines,  
dual-and single feeders, automatic rifles.**

**Technical Areas:**

**Engineering and development of small arms**

**Technical Specialties:**

**Design and consulting work in small arms field.**

**Information Resources:**

**Technical and patent library for own use only.**

**Remarks:**

**Holder of over 100 patents on small arms devices.**

**Descriptors:**

**Magazines  
Pistols  
Rifles  
Small arms design  
Submachine guns**

**Hercules Incorporated,  
Allegheny Ballistics Laboratory**

**P. O. Box 210  
Cumberland, MD 21502**

**Telephone: (304) 726-4500**

**Points of Contact**

**Gimler, John R. , Superintendent, Hazards  
Analysis and Service;**

**Principal Products**

**Commercial explosives; Solid propellants;  
Rocket motors.**

**Principal Services**

**Allegheny Ballistics Laboratory (ABL)  
principally a research and development facility  
for gun and rocket propellants and for gas generator  
and rocket motors ranging from the smallest  
propellant actuated device to ICBM motors.  
The facility is also a production site for rocket  
motors and ordnance items.**

**Technical Areas**

**Solid propellants; Specialty ordnance items;  
Tactical and strategic rocket motors; Environmental  
research in the areas of solid waste and water  
treatment.**

**Technical Specialties**

**Any phase of R & D on propellants and rocket  
motors; Activities range from laboratories  
engaged in the primary synthesis of new propellant  
ingredients to ballistic ranges test firing gun  
propellants and full scale ICBM rocket motors.**

**Information Resources**

**The ABL Library holdings presently include  
approximately 100,000 reports, 10,000 books  
and 150 active periodical subscriptions.**

**Descriptors**

**Aerodynamics  
Explosives  
Interior ballistics  
Propellants  
Stress analysis  
Therodynamics**

**Hercules Inc.  
Bacchus Works**

**Box 98  
Magna, UT 84044**

**Telephone: (801) 297-5911**

**Points of Contact**

**Scott, L. R. , Interior and External Ballistics;  
Richardson, D. E. , Terminal Ballistics and  
Target Effectivity;  
Peterson, H. L. , Projectile and Barrel Design;  
Smallwood, B. G. , Primers and Propellants  
Anderson, G. I. , Organisation.**

**Principal Products**

**Rocket motor development and production;  
Ammunition development**

**Technical Areas**

**R&D ordnance; MHD; Lasers; Composite  
materials; Propellants; Hazards; Rockets and  
missiles. Engineering development and Final  
Engineering: Ordnance; Composite materials;  
Propellants; Rockets and missiles. Production:  
Ordnance; Composite materials, Rockets; Interior,  
exterior, terminal ballistics; Ammunition design  
and development.**

**Technical Specialties**

**Advanced small arms ammunition; Carbon  
composite materials; Upper stage rockets;  
High energy propellants.**

**Information Resources**

**Data on Propellants**

**Descriptors**

**Exterior ballistics  
High energy propellants  
Interior ballistics  
Lasers  
Primers  
Propellants  
Terminal ballistics**

**The H&R Manufacturing Co.**

**20080 St. Clair Avenue  
Cleveland, OH 44119**

**Telephone: (216) 531-6070**

**Points of Contact:**

**Griffith, William L., President  
Bayer, Steven, Superintendent**

**Principal Products:**

**Production of weapons components and  
assemblies for all types of small arms.**

**Principal Services:**

**General close tolerance machining and  
assembling.**

**Technical Areas:**

**General machining; Specializing in production  
milling.**

**Technical Specialties:**

**Gun drilling and special milled shapes in  
bar lengths.**

**Descriptors:**

**Gun barrels  
Rifles  
Weapon fabrication**

**IIT Research Institute**

**10 West 35th Street  
Chicago, IL 60616**

**Telephone: (312) 225-9630**

**Points of Contact:**

**Johnson, Kenneth G., Assistant Director  
of Research**

**Nusbaum, Milton S., Senior Research Engineer  
Remaly, Robert, Manager, Chemical Energetics**

**Principal Services:**

**Research and development.**

**Technical Areas:**

**Ordnance operations research; Systems  
engineering; Hazard analysis; Product  
development, Ordnance testing; Propellant  
development.**

**Technical Specialties:**

**Interior; Exterior and terminal ballistics;  
Weapon design; Propellant design; Ammunition  
design.**

**Information Resources**

**IIT Information Sciences performs manual and  
automated searches of technical literature in  
engineering, chemical, biological, and food data  
bases.**

**Descriptors**

**Ammunition  
Exterior ballistics  
Interior ballistics  
Propellants  
Terminal ballistics**

**Kennametal Inc.**

**1 Lloyd Avenue  
Latrobe, PA 15650**

**Telephone: (412)537-3311**

**Point of Contact**

**Nichols, Omer W., Ordnance Engineer**

**Principal Products:**

**Cemented carbides and tungsten alloys materials.**

**Principal Services:**

**Manufacturing cores; Penetrators and fragments  
from tungsten carbides and tungsten alloys**

**Technical Areas:**

**Armor penetration and fragmentation**

**Technical Specialties:**

**Engineering capability to advise and assist in  
design of armor; Penetrating projectiles and  
fragmentation devices; Maintains range to test  
projectiles against armor plate.**

**Descriptors:**

**Armor  
Penetrators  
Fragmentation**

**Maremont Corporation, New England Group**

**P. O. Box 111  
Saco, ME 04072**

**Telephone: (207) 283-3611**

<b>Points of Contact</b>	<b>Thomasian, Berge, Vice President &amp; General Manager Folley, Cranston W., Manager R&amp;D Rauschke, Kenneth, Manager Ordnance Engineering</b>
<b>Principal Products</b>	<b>Machine guns, grenade launchers and rifle components, replacement barrels to 40mm.</b>
<b>Principal Services</b>	<b>Research &amp; development of machine guns and small weapons to 40mm.</b>
<b>Technical Areas</b>	<b>Design concepts studies; Math modeling; Stress, kinematic and dynamic analyses; T-D analyses; Reliability and maintainability factors and related computer programs.</b>
<b>Technical Specialties</b>	<b>Applied research, development, design and testing of light weapons and barrel components.</b>
<b>Descriptors</b>	<b>Dynamic analysis Grenade launchers Kinematic analysis Machine guns Maintainability Mathematical modeling Reliability Stress analysis</b>



**COL Wm. L. McCulla, Consultant**

**202 Poinciana Lane  
Largo, FL 33540**

**Telephone: (813) 584-5921 or  
(215) 544-7600**

<b>Points of Contact :</b>	<b>McCulla, COL Wm. L. , Consultant</b>
<b>Principal Products :</b>	<b>Small arms ammunition and its manufacture; Manufacturing and packaging equipment; Links, feeds etc.</b>
<b>Principal Services:</b>	<b>Consultation in small arms, small arms manufacture, manufacturing and packaging equipment.</b>
<b>Technical Areas:</b>	<b>Ammunition manufacturing; Consultant to the U.S. Army Munitions Command.</b>
<b>Technical Specialties:</b>	<b>New generation production equipment.</b>
<b>Descriptors:</b>	<b>Packaging Weapon fabrication</b>

**Perry Industries, Inc.**  
**(Bemis Company, Inc)**

**121 New South Road**  
**Hicksville, NY 11802**

**Telephone: (516) 433-2230**

**Points of Contact**

**Kalmar, William, Manager Special Machinery  
Department**

**Principal Products**

**Diversified manufacturer of packaging materials,  
systems and equipment.**

**Principal Services**

**Manufacture of packaging machinery and explosive  
filling and assembly machinery.**

**Technical Areas**

**Design, development, manufacture and  
assembly of equipment.**

**Technical Specialties**

**High and low speed powder filling machinery  
for ordnance items and other auxiliary parts  
handling systems.**

**Descriptors**

**Loading  
Packaging**

**Philco-Ford Corporation,  
Aeronutronic Division,  
Aerospace and Defense Systems Operation**

**Ford Road  
Newport Beach, CA 91663**

**Telephone: (714) 640-1500**

**Points of Contact:**                      **Brown, Benjamin C., Manager Ordnance Systems  
Advanced Development Operation**  
**Marshall, Donald L., Manager Ordnance Programs  
Ordnance Electromechanical Operation**

**Principal Products:**                      **Ordnance systems; Aerospace systems;  
Missile systems; Communication systems;  
Air defense systems; Air strike systems.**

**Principal Services:**                      **Ordnance development and test; Research and  
development laboratories; Missile development  
and test.**

**Descriptors**                                      **Weapon systems**

**R & D Associates**

**525 Wilshire Boulevard  
Santa Monica, CA 90403**

**Telephone: (213) 451-5838**

**Points of Contact**

**Helmbold, Robert L. Staff Member;  
Schaffer, Marvir B., Staff Member;  
Sanborn, James V., Staff Member.**

**Principal Services**

**R&D in tactical and strategic warfare advanced  
technology and systems; Consultation; Analysis;  
Operational evaluation of systems.**

**Technical Areas**

**Physical sciences; Engineering; Weapon design  
and analysis; Operational evaluation.**

**Remarks**

**Current small arms projects include light-  
weight propulsion systems, unconventional  
bullet/projectile concepts, high-powered laser  
applications, aluminum cartridge case technology.**

**Descriptors**

**Aluminum cartridge case  
Armor  
Lasers  
Tactical warfare**

**Remington Arms Company, Inc.,  
Bridgeport Research Division**

**939 Barnum Avenue  
Bridgeport, CT 06602**

**Telephone: (203) 333-1112**

**Points of Contact**

**Foote, D. S., Laboratory Director;  
Daubenspeck, B. K. Research Manager**

**Principal Products**

**Sporting arms and ammunition; Traps; Targets;  
Abrasive products.**

**Principal Services**

**Small arms ammunition research and  
development.**

**Technical Areas**

**Cold drawing; Forming and stamping of metals;  
Molding and extrusion of plastics; Development  
of primary explosives and primers; Exterior,  
interior and terminal ballistics.**

**Technical Specialties**

**High speed still and motion picture photography;  
High speed x-ray photography; Preparation of  
primary explosives and priming mixtures, primers,  
detonators, and testing facilities.**

**Remarks**

**Instrumented ranges from 50 yards to 200 yards.**

**Descriptors**

**Detonators  
Explosives  
Exterior ballistics  
High speed photography  
Interior ballistics  
Plastics  
Primers  
Targets  
Terminal ballistics  
X-Ray radiography**

**Remington Arms Company, Inc.,  
Ilion Research Division**

**Ilion, NY 13357**

**Telephone: (315) 894-9961**

<b>Points of Contact:</b>	<b>Leek, Wayne E., Manager, Firearms Research and Design</b>
<b>Principal Products:</b>	<b>Firearms and ammunition.</b>
<b>Principal Services:</b>	<b>Research and development.</b>
<b>Technical Areas:</b>	<b>Firearms design and model making.</b>
<b>Technical Specialties:</b>	<b>Measurements; Testing and analysis</b>
<b>Information Resources:</b>	<b>Related published texts and proprietary records.</b>
<b>Descriptors:</b>	<b>Ammunitions Small arms design</b>

**The Stanwick Corporation  
Stanwick Systems Engineering**

**14827 Ventura Boulevard  
Sherman Oaks, CA 91403**

**Telephone: (213) 788-9810**

**Points of Contact**

**Moss, Frank W. Vice President;  
Reed, Allen R., Group Executive**

**Principal Products**

**Engineering services and consulting;  
Computer data processing services;  
Maintenance analysis and operations.**

**Principal Services**

**Engineering services; Consultation;  
RAM analysis of weapon systems and  
components; Product improvement studies;  
Design, development; Prototype manufacturing.**

**Technical Areas**

**Small arms; Missile systems; Armored  
vehicles/tanks; Ordnance; Fire control  
systems; Night vision and infrared systems.**

**Technical Specialties**

**Special techniques for mathematical modeling  
of wear/material damage have been developed  
and applied to small arms; Weapon fire  
control systems and night vision equipment.**

**Descriptors**

**Armor  
Maintainability  
Mathematical models  
Reliability**

**Sturm, Ruger and Co., Inc.**

**Lacey Place  
Southport, CT 06490**

**Telephone: (203) 259-7843**

**Point of Contact**

**Ruger, William B., President**

**Principal Products**

**Manufacture of rimfire pistols and  
revolvers, center fire single action and  
double action revolvers, rimfire and  
center fire rifles.**

**Technical Specialties**

**Design and engineering of firearms  
as well as all of tooling and special  
purpose machines.**

**Remarks**

**As one of its divisions, the Pine Tree  
Castings Co. is a producer of highly  
stressed firearms components by the  
investment casting process (ferrous  
metals). Pine Tree supplies to Sturm,  
Ruger & Co. and to other small arms  
manufacturers.**

**Descriptors**

**Pistols  
Revolvers  
Rifles  
Small arms design  
Weapon fabrication**



**Systems Consultants Incorporated  
Management And Data Systems Division**

**221 West 57th Street  
New York, NY 10019**

**Telephone: (212) 489-1160**

<b>Point of Contact:</b>	<b>Golden, Joseph H. , Senior Systems Engineer</b>
<b>Principal Products:</b>	<b>Design and development of systems for data acquisition and processing, test and evaluation, display and recording, data base management and information management.</b>
<b>Principal Services:</b>	<b>Design, development and analysis of electronic and computer based systems; Electronic warfare and weapon systems analysis; Systems engineering; Systems integration; Computer software development; Software management.</b>
<b>Technical Areas:</b>	<b>Instrumentation planning, design and implementation; Data acquisition systems; Test and evaluation; Communications; Electronic packaging and mechanical design; Human factors engineering; Automation and process control; Real time software; Reliability and maintainability, data base systems; Information management.</b>
<b>Technical Specialties:</b>	<b>Automated ballistic testing systems, automated data acquisition systems, information management.</b>
<b>Remarks:</b>	<b>Compiled SATIN source locator and thesaurus. Developed ARMS (Automated Range Management System) and BTSM (Ballistics Testing Sub Module for SCAMP program) automated ballistics testing systems for Frankford Arsenal.</b>
<b>Descriptors</b>	<b>Ballistic tests Reliability Test equipment</b>

**D. B. Wesson Company, Inc.**

**293 Main Street  
Monson, ME 01057**

**Telephone: (413) 267-4081**

**Point of Contact:**

**Wesson, Dan, President**

**Principal Products:**

**Revolvers**

**Principal Services:**

**Manufacture and R&D of handguns.**

**Technical Areas:**

**R&D; Engineering; Manufacture**

**Descriptors:**

**~~Revolvers~~**

**Small arms design**

SECTION IV

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•.22 LONG RIFLE CONVERSION FOR M-16

•ACEAL PLASTICS

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.  
•ACT (FORMERLY DESVAL)

•.223 M1 CARBINE

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKIEY, CHARLES M.  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
BALDINI, LUIGI F.

•A-X GUN SYSTEM

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
STARLING, JAMES F.

•ADV. AUTOMATIC AIRCRAFT GUN XM140

•ABM SYSTEMS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMRC  
CHOU, SHUN-CHIN (DR.)

•ADVANCED MACHINE GUN CONCEPTS

ACCEPTANCE TESTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
SCHLENNER, ROBERT J.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

•ADVANCED MACHINE GUN SYSTEM

FULTON, CHARLES L.  
JEFFERSON PROVING GROUND, MAT. TST. DIR.  
WEBB, JACK B.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

ACCURACY TEST DATA

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INFORMATION HANDLING ACTIVITIES  
ABERDEEN PROVING GROUNDS, TECHNICAL LIBRARY  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BRAUN, WALTER F.

ACCURACY TESTS

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
KATSANIS, DAVID J. (DR.)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

EDGEWOOD ARSENAL  
MILLER, MILES C.  
EDGEWOOD ARSENAL, CHEMICAL LAB.  
FLATAU, ABRAHAM

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

AERODYNAMICS (CONT'D)

INDUSTRIAL SOURCES  
HERCULES INC., BACCHUS WORKS

•AERTHERMODYNAMICS

INDUSTRIAL SOURCES  
CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

•AIR STRIKE SYSTEMS

INDUSTRIAL SOURCES  
PHILCO-FORD CORPORATION, AERONAUTRONIC DIV.

AIRCRAFT AMMUNITION

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
MILLER, PAUL H.  
WARD, JOHN S.  
NAVAL AIR SYSTEMS COMMAND  
SAUBER, JOHN

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

AIRCRAFT ARMAMENTS

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
BATES, JACK  
GULTICK, LEONARD  
ROMERO, EDUARDO S.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.  
LINSAY, JOHN T. (LT. COL.)  
STARLING, JAMES F.  
FORT RUCKER, COMBAT DEV. COMMAND, AVIATION AGENCY  
GARBARINI, JOHN  
NAVAL AIR SYSTEMS COMMAND  
SAUBER, JOHN  
ROCK ISLAND APSENAL, WECOM, WEAPONS LAB  
REYNOLDS, JOHN  
ROCHA, JOHN G.  
WALLEN, STUVIE C.

AIRCRAFT ARMAMENTS (CONT'D)

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

•AIRCRAFT CANNON PARAMETER FUZE STUDY

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
RUTLAND, J. ANDREW

•AIRCRAFT ROCKETS (2.75")

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, MUCOM  
RUTKOVSKY, HYMAN O.

•ALUMINUM ALLOYS

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
ISSEROW, SAUL (DR.)

ALUMINUM CARTRIDGE CASES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
HEINEY, OTTO K.

INDUSTRIAL SOURCES  
R & D ASSOCIATES

•ALUMINUM CASED AMMUNITION FIRING FIXTURES

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
FAGG, CHARLES R.  
LORENZEN, THEODORE G.

•ALUMINUM MILL PRODUCTS

INDUSTRIAL SOURCES  
ALUMINUM COMPANY OF AMERICA, APPLICATION ENG. DIV.

# AMMUNITION

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

## GOVERNMENT PERSONNEL

ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
JOHNSON, HAROLD E.  
FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR.  
SNOPEK, ROBERT G.  
FRANKFORD ARSENAL, MANUFACTURING TECHNOLOGY DIR.  
PENN, HARRY G.

SHINDLER, CHARLES E.  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKY, CHARLES M.

DORIS, THOMAS A. JR.  
MCHUGH, ROBERT J.

SCHUPP, WALTER  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.

QUITMAN, WILLIAM  
NAVAL AMMUNITION DEPOT, RESEARCH AND DEV. DEPT.

SMITH, PHILIP J.

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.

NARDONE, JOHN

PICATINNY ARSENAL, MUCOM  
RUTKOVSKY, HYMAN D.

FRANKFORD ARSENAL, TECHNICAL LIBRARY  
INFORMATION HANDLING ACTIVITIES

## INDUSTRIAL SOURCES

AMRON CORP.  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
COL. W. L. MCCULLA, CONSULTANT  
FEDERAL CARTRIDGE CORP.  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV.  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.  
HERCULES INC., BACCHUS WORKS  
ITT RESEARCH INSTITUTE  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.  
REMINGTON ARMS CO., INC., ILION RESEARCH DIV.  
THE BUD COMPANY, TECHNICAL CENTER

## \*AMMUNITION CONTAINERS

INDUSTRIAL SOURCES  
CHRYSLER CORPORATION

# \*AMMUNITION FOR STONER WEAPON SYSTEM

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BORNHEIM, GEORGE H.

## \*AMMUNITION INSPECTION TECHNIQUES

INDUSTRIAL SOURCES  
GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

## \*AMMUNITION PRODUCTION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BYSURA, CARL J.  
ROANE, LESTER  
THOMPSON, JOSEPH F.

CHINA LAKE, NAVAL WEAPONS CENTER  
MILLER, PAUL H.

FRANKFORD ARSENAL, MANUFACTURING TECHNOLOGY DIR.  
PENN, HARRY G.  
SHINDLER, CHARLES E.

PICATINNY ARSENAL, MUCOM  
RUTKOVSKY, HYMAN D.

## INDUSTRIAL SOURCES

AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
COL. W. L. MCCULLA, CONSULTANT  
FEDERAL CARTRIDGE CORP.  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

## \*AMMUNITION/GUN INTERFACE

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

## \*ANNEALING

INDUSTRIAL SOURCES  
GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

## ANTI-AIRCRAFT AMMUNITION

GOVERNMENT PERSONNEL  
EGLTN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
MCHILLAN, FRANCIS

ANTI-AIRCRAFT AMMUNITION (CONT'D)

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INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

ANTI-AIRCRAFT WEAPONS

ANTI-TANK AMMUNITION

INFORMATION HANDLING ACTIVITIES  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

INFORMATION HANDLING ACTIVITIES  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

ANTI-MATERIEL AMMUNITION

ANTI-TANK WEAPONS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
D'ANDREA, JOSEPH A.

INFORMATION HANDLING ACTIVITIES  
BATTLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV.  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

ANTI-MATERIEL WEAPONS

INDUSTRIAL SOURCES

CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

INDUSTRIAL SOURCES

CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

ANTI-PERSONNEL AMMUNITION

• AR-18 RIFLE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
D'ANDREA, JOSEPH A.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TEST CENTER  
DAVIS, DALE M.

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
SHANAHAN, C.O.

FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS  
SMITH, ROBERT C.

ARC MELTING

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, SCIENCE & TECH. INFORMATION BR.

INFORMATION HANDLING ACTIVITIES  
BATTLE MEMORIAL INST., COLUMBUS LAB.

ANTI-PERSONNEL WEAPONS

INDUSTRIAL SOURCES  
BATTLE MEMORIAL INST., COLUMBUS LAB.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
CRIDER, CHARLES L.

• ARMAMENT FOR MILITARY ASSISTANCE PROGRAM (MAP)

GOVERNMENT PERSONNEL  
NAVAL ORDINANCE SYSTEMS COMMAND  
TODARO, DONALD G. (LCDR)

INFORMATION HANDLING ACTIVITIES  
FORT ORD, CDEC FIELD EXPERIMENTATION DATA BANK

•ARMAMENT SYSTEMS

INDUSTRIAL SOURCES  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT

ARMOR

•ARMS (AUTOMATED RANGE MANAGEMENT SYSTEM)

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

INDUSTRIAL SOURCES  
CHRYSLER CORPORATION  
KENNAMETAL INC.

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

R & D ASSOCIATES  
THE STANWICK CORP., STANWICK SYSTEMS ENGINEERING

•ARMY SMALL ARMS PROGRAM (ARSAP)

•ARMOR MACHINE GUN

GOVERNMENT PERSONNEL  
ARMY RES. AND DEV.  
SHELTON, HENRY R. (COL.)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
THOMPSON, STANLEY R.

FORT BENNING, COMBAT DEV. COMMAND INFANTRY AGCY.  
PADNE, JOSEPH F. (MAJ.)

•ARMOR PENETRATING PROJECTILES

•ARMY SMALL ARMS REQUIREMENTS STUDY (ASARS)

INDUSTRIAL SOURCES  
KENNAMETAL INC.

GOVERNMENT PERSONNEL  
FORT BENNING, COMBAT DEV. COMMAND INFANTRY AGCY.  
PADNE, JOSEPH F. (MAJ.)

•ARMOR PENETRATION

AUTOFRETTAGE

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
REAGON, ROBERT

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
KENDALL, DAVID P.

ARMOR PIERCING AMMUNITION

OSHARA, GLEN P.  
VASILAKIS, JOHN D. (DR.)

GOVERNMENT PERSONNEL

WATERTOWN ARSENAL, AMMRC  
DOHERTY, STEPHAN J.

•AUTOMATED AMMUNITION PRODUCTION

INDUSTRIAL SOURCES  
GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

ARMOR PIERCING AMMUNITION

•AUTOMATED BALLISTIC TESTING

INFORMATION HANDLING ACTIVITIES  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

•ARMOR, LIGHTWEIGHT, STRUCTURAL BEHAVIOR

•AUTOMATED RANGE FACILITIES

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
CHAIT, RICHARD

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
JONES, ROBERT M.



## •AUTOMATED RANGE MANAGEMENT SYSTEM (ARMS)

## BALLISTIC RANGES

## GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

## GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BRAUN, WALTER F.

## INDUSTRIAL SOURCES

SYSTEMS CONSULTANTS INCORPORATED

## BALLISTIC TEST DATA

## •AUTOMATIC M75 GRENADE LAUNCHER

FRANKFORD ARSENAL, TECHNICAL LIBRARY

## INFORMATION HANDLING ACTIVITIES

## BALLISTIC TESTS

## GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ROCHA, JOHN G.

## GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
KATSANIS, DAVID J. (DR.)

## •AUTOMATIC RIFLES

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

## INDUSTRIAL SOURCES

HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

## •AUTOMATIC TEST EQUIPMENT

FULTON, CHARLES L.

JEFFERSON PROVING GROUND, MAT. TST. DIR.

## INDUSTRIAL SOURCES

A4J CORPORATION.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

WRIGHT PATTERSON AFB, FLIGHT DYNAMICS LAB.

## AUTOMATIC WEAPONS

CRUZE, CHARLES D.

## GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.

ABERDEEN PROVING GROUNDS, TECHNICAL LIBRARY  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

KIRKENDALL, RICHARD

LENTZ, STANLEY

FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR.

MOWREY, FRED H.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

ROCHA, JOHN G.

## INDUSTRIAL SOURCES

ARES, INC.

CALSPAN CORPORATION

GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV  
SYSTEMS CONSULTANTS INCORPORATED

## INFORMATION HANDLING ACTIVITIES

## BALLISTICS

BAYTELLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV

## INDUSTRIAL SOURCES

ARES, INC.

GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV

## GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKEY, CHARLES M.

BALLISTICS (CONT'D)	BREECH MECHANISMS
<p>INFORMATION HANDLING ACTIVITIES</p> <p>PICATINNY ARSENAL, SCIENCE &amp; TECH. INFORMATION BR.</p>	<p>INDUSTRIAL SOURCES</p> <p>GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV</p>
*BARREL EROSION	*BREECH KING
<p>INFORMATION HANDLING ACTIVITIES</p> <p>WATERVLLET ARSENAL, TECH. INFORMATION SERVICES</p>	<p>GOVERNMENT PERSONNEL</p> <p>WATERVLLET ARSENAL, BENET WEAPONS LAB.</p> <p>O'HARA, GLEN P.</p>
BELT LINKS	*BROWNING MACHINE GUNS, CAL. .30 & CAL. .50
<p>INDUSTRIAL SOURCES</p> <p>BORG-WARNER CORP., SPRING/BRUNNER DIVISION</p>	<p>GOVERNMENT PERSONNEL</p> <p>ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB</p> <p>ASH, DENNIS</p> <p>GIBSON, WILMOT</p>
<p>GOVERNMENT PERSONNEL</p> <p>ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.</p> <p>GROLLMAN, BERTRAM</p> <p>FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.</p> <p>WHITE, WILMER</p>	BULLETS
BODY ARMOR	*BUSHMASTER
<p>GOVERNMENT PERSONNEL</p> <p>NAVAL ORDINANCE SYSTEMS COMMAND</p> <p>HICKS, ELMER L.</p> <p>PICATINNY ARSENAL, FELTMAN RESEARCH LAB.</p> <p>HUVANETZ, CHARLES J.</p> <p>WATERTOWN ARSENAL, AMMRC</p> <p>CHAIT, RICHARD</p>	<p>GOVERNMENT PERSONNEL</p> <p>ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.</p> <p>BARAN, ANTHONY</p> <p>FRANKFORD ARSENAL, PITMAN-DUNN LAB.</p> <p>THILO, EDWARD R.</p> <p>ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB</p> <p>ROCHA, JOHN G.</p> <p>WATERTOWN ARSENAL, AMMRC</p> <p>RIFFIN, PAUL V.</p>
BONDING	
<p>INFORMATION HANDLING ACTIVITIES</p> <p>BATTELLE MEMORIAL INST., COLUMBUS LAB.</p>	*C.E.M. WEAPONS AND AMMUNITION
<p>INDUSTRIAL SOURCES</p> <p>BATTELLE MEMORIAL INST., COLUMBUS LAB.</p>	<p>GOVERNMENT PERSONNEL</p> <p>ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.</p> <p>DONNELLY, EMMET F.</p>
BREECH BLOCKS	*CANNON LAUNCHED GUIDED PROJECTILE (CLGP)
<p>GOVERNMENT PERSONNEL</p> <p>WATERVLLET ARSENAL, BENET WEAPONS LAB.</p> <p>O'HARA, GLEN P.</p>	<p>GOVERNMENT PERSONNEL</p> <p>ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB</p> <p>VAUGHAN, EDWIN M.</p>

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• CARTRIDGE CASE PRODUCTION

INDUSTRIAL SOURCES

GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

CARTRIDGE CASES

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BYSURA, CARL J.

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
BILSBURY, STEPHEN J. (MAJ.)

ROBBINS, JOHN  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BORNHEIM, GEORGE M.

INDUSTRIAL SOURCES

ALUMINUM COMPANY OF AMERICA, APPLICATION ENG. DIV.  
AMRON CORP

GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

• CARTRIDGE DESIGN

GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
SCHLENNER, ROBERT J.

• CARTRIDGE, 7.62MM, BLANK, M82

GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
WHITE, WILMER

CARTRIDGES

INFORMATION HANDLING ACTIVITIES  
ABERDEEN PROVING GROUND, TECHNICAL LIBRARY

• CASELESS AMMO FIRING FIXTURES, 5.56 AND 27MM.

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.

• CASELESS AMMUNITION

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MAGARDO, ROBERT F.

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BORNHEIM, GEORGE M.

DICKEY, CHARLES M.  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
LANTZ, ROBERT

INDUSTRIAL SOURCES

BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.

• CASELESS AMMUNITION WEAPONS

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
BUTTERWORTH, DONALD S.

• CASELESS PROPELLANTS

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
VISNOV, MARTIN

• CB PROTECTIVE SHELTERS AND VEHICLES

INDUSTRIAL SOURCES

GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV

• CERAMIC FACED ARMOR

GOVERNMENT PERSONNEL

WATERTOWN ARSENAL, AMMRC  
CHAIT, RICHARD

CERAMICS

INFORMATION HANDLING ACTIVITIES

BATTELLE MEMORIAL INST., METALS & CERAMICS INC. CN

CHEMICAL AMMUNITION

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
HAYNER, MICHAEL  
SHAFF, LARRY T.

\*CHEMICAL WEAPONS

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
SHAFF, LARRY T.

CHEMICALS

INDUSTRIAL SOURCES  
E. I. DUPONT DE NEMOURS & CO., ELASTOMER CHEM. DEP

\*CHEYENE ARMAMENT SYSTEM

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WALLEN, STUVIE C.

CHRONOGRAPHS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

\*CIVIL DISTURBANCE

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
SHAFF, LARRY T.

\*CLIPS

INDUSTRIAL SOURCES  
BORG-WARNER CORP., SPRING/BRUNNER DIVISION

\*CLOSED BREECH AND RECOILLESS LAUNCHERS

INDUSTRIAL SOURCES  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV

COATING PROCESSES

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

COATINGS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
PEARLSTEIN, FRED  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WOLFF, RUSSELL

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES

AMRON CORP  
BATTELLE MEMORIAL INST., COLUMBUS LAB.  
CALSPAN CORPORATION  
E. I. DUPONT DE NEMOURS & CO., ELASTOMER CHEM. DEP

\*COLD DRAWING

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

\*COMBAT SIMULATION

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DUNCAN, ROBERT E.

\*COMBUSTIBLE FIBERS

INDUSTRIAL SOURCES  
BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.

\*COMBUSTION CHEMISTRY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.

•COMBUSTION CHEMISTRY (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
VISNOV, MARTIN

•COMMERCIAL EXPLOSIVES

INDUSTRIAL SOURCES  
HERCULES INC., ALLEGANY BALLISTICS LAB.

•COMPARATIVE EVALUATIONS OF SELECTED SMALL ARMS

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

•COMPONENTS EXPLORATORY DEVEL., SMALL ARMS SYST.

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMRC  
CHOU, SHUN-CHIN (DR.)

COMPOSITE MATERIALS

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
KENDALL, DAVID P.

INFORMATION HANDLING ACTIVITIES  
BATTILLE MEMORIAL INST., METALS & CERAMICS INF. CN  
WATERVLIET ARSENAL, TECH. INFORMATION SERVICES

COMPUTER SIMULATION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BAER, PAUL G.

DEAS, ROBERT  
GAY, HERMAN PAUL  
GREENE, ROBERT  
TRAFTON, THOMAS R.  
WINEHOLT, EMMA M.  
EDGEWOOD ARSENAL  
MILLER, MILES C.  
EDGEWOOD ARSENAL, CHEMICAL LAB.  
FLATAU, ABRAHAM

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COMPUTER SIMULATION (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES  
ROCK ISLAND ARSENAL, WECDM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

INDUSTRIAL SOURCES  
CALSPAN CORPORATION  
CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

•CONSULTING

INDUSTRIAL SOURCES  
COL. W. L. MCCULLA, CONSULTANT  
HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.

•COPPER

INFORMATION HANDLING ACTIVITIES  
BATTILLE MEMORIAL INST., COPPER DATA CENTER

•COPPER ALLOYS

INFORMATION HANDLING ACTIVITIES  
BATTILLE MEMORIAL INST., COPPER DATA CENTER

CORROSION

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
PEARLSTEIN, FRED

INFORMATION HANDLING ACTIVITIES  
WATERVLIET ARSENAL, TECH. INFORMATION SERVICES

CORROSION INHIBITORS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
PEARLSTEIN, FRED

CORROSION INHIBITORS (CONT'D)

•DEFA GUN STUDY

INFORMATION HANDLING ACTIVITIES  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
STARLING, JAMES F.

COST EFFECTIVENESS

•DEGRADATION EFFECTS PROGRAM

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, MUCOM  
MATZKOWITZ, WILLIAM

•COUNTER AMBUSH BARRAGE WEAPON

•DELTA ACETAL RESINS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
LANDIS, ELMER

INDUSTRIAL SOURCES  
E. I. DUPONT DE NEMOURS & CO., PLASTICS DEPARTMENT

•CREDIBLE CHASE

•DEPT COORDINATION (OVERHAUL SMALL ARMS WEAPONS)

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
STARLING, JAMES F.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, MAINTENANCE DIR.  
DORBECK, RICHARD J.

•CROW HAND HELD GRENADE LAUNCHERS

•DESIGN AUTOMATION

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.

INDUSTRIAL SOURCES  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.

•CS MUNITIONS

•DESIGN EVALUATION OF 20-40MM WEAPON SYSTEM

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
HAYNER, MICHAEL

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY

•DATA ACQUISITION SYSTEMS

•DESVAL

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY

•DAVY CROCKET-XM28 AND XM29

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKLEY, CHARLES M.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

•DESVAL AND COMPONENTS APPLIED RESEARCH

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DIFFUSION BONDING (CONT'D)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

DETONATORS

•DIMTRACER

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
VORECK, WALLACE E.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DORIS, THOMAS A. JR.

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, SCIENCE & TECH. INFORMATION BR.

DISSEMINATION TECHNOLOGY

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL

MONOHAN, HUGH (JR.)  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
HAYNER, MICHAEL

•DIAGNOSTIC CENTER FOR SMALL ARMS WEAPON SYSTEMS

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
SHEFFIELD, OLIVER E.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKY, CHARLES M.

•DRAG REDUCING FUMER PROJECTILE

DIAGNOSTIC SYSTEMS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

•DUAL CYCLE RATE WEAPON

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKIVRIGAN, JAMES

•DIES

•DUAL CYCLE RTFLE

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

DIFFUSION BONDING

•DUAL PURPOSE AMMUNITION

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS  
SMITH, ROBERT C.

• DUPLUX AMMUNITION

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKEY, CHARLES M.

ELECTRON BEAM MELTING (CONT'D)

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

DYNAMIC ANALYSIS

INDUSTRIAL SOURCES  
HAREMONT CORPORATION, NEW ENGLAND GROUP

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)

• DYNAMIC TESTING OF PRESSURIZED CYLINDERS

• EMBEDDING PLASTICS

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
KENDALL, DAVID P.

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.

• EFFECTIVENESS ANALYSIS

• EMBRITTLEMENT

INDUSTRIAL SOURCES  
AAI CORPORATION,

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
EBIHARA, WILLIAM T. (DR.)

• ELASTIC/PLASTIC ANALYSIS OF THICK-WALLED TUBES

• ENCAPULATED MINE COMPONENTS

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
VASILAKIS, JOHN D. (DR.)

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
NARDONE, JOHN

ELASTOMERS

• ENVIRONMENTAL CONTROL SYSTEMS

INDUSTRIAL SOURCES

E. I. DUPONT DE NEMOURS & CO., ELASTOMER CHEM. DEP

INDUSTRIAL SOURCES  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV

ELECTRODEPOSITION

• ENVIRONMENTAL EFFECTS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WOLFF, RUSSELL

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
PEARLSTEIN, FRED  
TEITELL, LEONARD (DR.)

ELECTRON BEAM MELTING

• ENVIRONMENTAL PROTECTION

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES  
CALSPAN CORPORATION



## \*ENVIRONMENTAL RESEARCH

INDUSTRIAL SOURCES  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV.  
HERCULES INC., ALLEGANY BALLISTICS LAB.

\*EXPLORATORY AND ADVANCED DEVELOPMENT OF SMALL ARMS

GOVERNMENT PERSONNEL  
ARMY MATERIAL COMMAND, HEADQUARTERS  
COSGROVE, THOMAS E.

## \*ENVIRONMENTAL TESTING

\*EXPLORATORY DEVELOPMENT OF GRENADE LAUNCHERS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
AMES, VERNON G.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DUNCAN, ROBERT E.

## INDUSTRIAL SOURCES

BULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.

## EXPLOSIVE BONDING

## EROSION

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
KOWALICK, JAMES F. (DR.)

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ERIHARA, WILLIAM T. (DR.)  
VAUGHAN, EDWIN M.  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
PEPE, JOSEPH (DR.)

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

## \*EXPLOSIVE DEVICES

INDUSTRIAL SOURCES  
CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV  
WATERVLIET ARSENAL, TECH. INFORMATION SERVICES

## \*EXPLOSIVE FORMING

## ESCAPEMENTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
KOWALICK, JAMES F. (DR.)

INDUSTRIAL SOURCES  
BULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.

## \*EXPLOSIVE PHENOMENA

## \*EXPANDED PLASTICS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
KOWALICK, JAMES F. (DR.)

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.

## \*EXPLOSIVE TRAIN ARMING

INDUSTRIAL SOURCES  
BULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.

•EXPLOSIVE TRAIN DESIGN

INDUSTRIAL SOURCES  
AAI CORPORATION,

EXPLOSIVE TRAINS

•EXTENDED RANGE AMMUNITION

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, CHEMICAL LAB.  
FLATAU, ABRAHAM

EXTERIOR BALLISTICS

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
VORECK, WALLACE E.

INDUSTRIAL SOURCES

AAI CORPORATION,  
RULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.

•EXPLOSIVE-ACTUATED DEVICES

INDUSTRIAL SOURCES  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV

EXPLOSIVES

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
KOWALICK, JAMES F. (DR.)  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
MATSUGUMA, HAROLD J.  
SHEFFIELD, OLIVER E.  
VORECK, WALLACE E.

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, SCIENCE & TECH. INFORMATION BR.

INDUSTRIAL SOURCES

AAI CORPORATION,  
BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.  
CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.  
THE BUD COMPANY, TECHNICAL CENTER

•EXPLOSIVES LOADING MACHINERY

INDUSTRIAL SOURCES  
PERRY INDUSTRIES, INC.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.

BRAUN, WALTER F.

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

KATSANIS, DAVID J. (DR.)

EDGEWOOD ARSENAL

HONOHAN, HUGH (JR.)

EDGEWOOD ARSENAL, CHEMICAL LAB.

FLATAU, ABRAHAM

EDGEWOOD ARSENAL, DEV. AND ENG. DIR.

HAYNER, MICHAEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR

DAVIS, DALE M.

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.

BORNHEIM, GEORGE M.

DICKEY, CHARLES M.

MINCINI, ANGELO N. (JP.)

REAGON, ROBERT

SCHLENNER, ROBERT J.

SCHUPP, WALTER

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.

DONAHUE, JAMES A.

FULTON, CHARLES L.

ROCK ISLAND ARSENAL, WFCOM, WEAPONS LAB

DUNCAN, ROBERT E.

INFORMATION HANDLING ACTIVITIES  
ABERDEEN PROVING GROUNDS, TECHNICAL LIBRARY

INDUSTRIAL SOURCES

AAI CORPORATION,  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
CALSPAN CORPORATION  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
HERCULES INC., BACCCHUS WORKS  
ITT RESEARCH INSTITUTE  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

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•EX113 COLORED SIGNALS

FIELD TESTS

GOVERNMENT PERSONNEL  
NAVAL AMMUNITION DEPOT, RESEARCH AND DEV. DEPT.  
SMITH, PHILIP J.

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
SHANAHAN, C.O.

•FABRICATION METALLURGY

•FILAMENT WINDING TECHNOLOGY

INDUSTRIAL SOURCES  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
MERRILL, EIG

•FACILITY AUTOMATION

FIRE CONTROL COMPONENTS

INDUSTRIAL SOURCES  
AAT CORPORATION,

GOVERNMENT PERSONNEL  
FORT RUCKER, COMBAT DEV. COMMAND, AVIATION AGENCY  
GARBARINI, JOHN

FATIGUE (MATERIALS)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)  
VAUGHAN, EDWIN M.

INFORMATION HANDLING ACTIVITIES  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

FIRE CONTROL SYSTEMS

•FIBERGLASS AND HONEYCOMB STRUCTURES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

INDUSTRIAL SOURCES  
BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.  
FIELD MAINTENANCE

GOVERNMENT PERSONNEL  
FORT RUCKER, COMBAT DEV. COMMAND, AVIATION AGENCY  
GARBARINI, JOHN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, MAINTENANCE DIR.  
DORBECK, RICHARD J.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
UPSON, HARRY W. (JR.)

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV

FIRING PINS

•FIELD TESTING

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
JONES, ROBERT M.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DUNCAN, ROBERT E.

•FIRING PORT WEAPON-MICV

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, CDC MAINTENANCE AGCY.  
LEE, CLAYTON RICHARD  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MAGARDO, ROBERT F.  
MCKIVRIGAN, JAMES

•FIRING PORT WEAPON-MICV (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
 ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 ROANE, LESTER  
 ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
 POST, JOHN S.  
 SCHUMACHER, CARROL

•FIRTFUSES

INDUSTRIAL SOURCES  
 THE BELLMORE-JOHNSON TOOL CO.

•FLAME SPRAYING

INFORMATION HANDLING ACTIVITIES  
 BATTLE MENDRIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES  
 BATTLE MENDRIAL INST., COLUMBUS LAB.

•FLASH

GOVERNMENT PERSONNEL  
 FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 STIEFEL, LUDWIG

•FLECHETTE DISPERSION

GOVERNMENT PERSONNEL  
 FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 REAGON, ROBERT

•FLECHETTE TRACER

GOVERNMENT PERSONNEL  
 FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 DORIS, THOMAS A. JR.

FLECHETTES

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 BAER, JOHN LARRY  
 ROANE, LESTER

FLECHETTES (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
 ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 THOMPSON, JOSEPH F.  
 EGLIN AIR FORCE BASE, AMMUNITION DEV. AND TEST CENTER  
 MCWILLAN, FRANCIS  
 FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 ROLDF, TERRY (OR.)  
 BORNHEIM, GEORGE M.

DICKEY, CHARLES M.  
 MCHUGH, ROBERT J.

MINCINI, ANGELO H. (JR.)  
 SCHLENNER, ROBERT J.

SCHUPP, WALTER  
 FRANKFORD ARSENAL, MITMAN-DUNN LAB.

THILD, EDWARD M.  
 FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.

BALDINI, LUIGI F.  
 PICATINNY ARSENAL, FELTHAM RESEARCH LAB.

HIVANETZ, CHARLES J.  
 PICATINNY ARSENAL, WUCOM

MATZADONITZ, WILLIAM  
 ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

BRADDOCK, CHARLES J.  
 WATERTOWN ARSENAL, AMMC  
 DEMERY, STEPHAN J.

•FORCE-TIME FUNCTION

GOVERNMENT PERSONNEL  
 ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
 SCHUMACHER, CARROL

•FOREIGN AMMUNITION

GOVERNMENT PERSONNEL  
 ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
 GOOCH, WILLIAM A.

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
 QUITMAN, WILLIAM

•FOREIGN MATERIAL EXPLOITATION PROGRAM

GOVERNMENT PERSONNEL  
 FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
 QUITMAN, WILLIAM

FOREIGN SMALL ARMS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BROSSEAU, TIMOTHY  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
JOHNSON, HAROLD E

\*FOREIGN WEAPONS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

\*FORMING AND STAMPING OF METALS

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

\*FOULING

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

\*FOULING AND EROSION M16A1 RIFLE

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

FRACTURE MECHANICS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, METALS ENGINEERING BR.  
CORRIE, JOHN D.

FRACTURE PROPERTIES

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DUNCAN, ROBERT E.  
VAUGHAN, EDWIN M.  
WATERTOWN ARSENAL, AMMRC  
CHAIT, RICHARD  
RIFFIN, PAUL V.

FRACTURE PROPERTIES (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
WATERTOWN ARSENAL, BENET WEAPONS LAB.  
KENDALL, DAVID P.  
PEPE, JOSEPH (DR.)

\*FRAGMENTATION

INDUSTRIAL SOURCES  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
FRAGMENTATION AMMUNITION

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVANETZ, CHARLES J.

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

\*FRAGMENTATION ARTILLERY SHELL

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
RIFFIN, PAUL V.

\*FRAGMENTATION DEVICES

INDUSTRIAL SOURCES  
KENNAMETAL INC.

\*FRAGMENTATION MECHANISMS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, METALS ENGINEERING BR.  
CORRIE, JOHN D.

\*FRAGMENTATION STEELS

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
RIFFIN, PAUL V.

FRANGIBLE AMMUNITION

•FUTURE RIFLE SYSTEM (FRS)

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKEY, CHARLES H.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, CDC MAINTENANCE AGCY.  
LEE, CLAYTON RICHARD

FRICTION BONDING

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BAER, JOHN LARRY  
D'ANDREA, JOSEPH A.  
GRUNER, FREDERICK  
ROANE, LESTER  
STRUVE, JOHN

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

ARMY MATERIAL COMMAND, HEADQUARTERS  
COSGROVE, THOMAS E.

ARMY RES. AND DEV.

FRICTION WEAR

SHELTON, HENRY R. (COL.)  
FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR.  
MOWREY, FRED H.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
GISSER, HENRY (DR.)

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BOLDT, TERRY (DR.)  
BORNHEIM, GEORGE H.  
MINCINI, ANGELO N. (JR.)  
SCHUPP, WALTER

INFORMATION HANDLING ACTIVITIES  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

•FUTURE GRENADE LAUNCHER SYSTEM

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVADETZ, CHARLES J.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

PICATINNY ARSENAL, WUCOM  
MATZKOWITZ, WILLIAM  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ACKLEY, JAMES

•FUTURE PERSONAL DEFENSE WEAPONS SYSTEM

DUNCAN, ROBERT F.  
POST, JOHN S.  
VAUGHAN, EDWIN M.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

•FUTURE RIFLE SYSTEM GRENADE

•FUTURE POINT FIRE WEAPON SYSTEM

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

•FUTURE RIFLE SYSTEM GRENADE LAUNCHER

•FUTURE RIFLE FLECHETTE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
D'ANDREA, JOSEPH A.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKIVRIGAN, JAMES

\*FUTURE RIFLE, .17 CAL.

GAS DYNAMICS (CONT'D)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKIVRIGAN, JAMES

INDUSTRIAL SOURCES  
CALSPAN CORPORATION

\*FUTURE WEAPONS SYSTEM (FWS)

\*GAS GENERATORS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DIBENEDEYTO, JOSEPH

INDUSTRIAL SOURCES  
HERCULES INC., ALLEGANY BALLISTICS LAB.

\*GAS GUN

FUZES

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL  
MONAHAN, HUGH (JR.)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE W.  
FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR  
SNOPEK, ROBERT G.

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVANETZ, CHARLES J.

GAS OPERATED GUNS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GERBER, NATHAN

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV

GAS PRESSURE BONDING

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BATTELLE MEMORIAL INST., COLUMBUS LAB.

INDUSTRIAL SOURCES  
AAI CORPORATION,  
BULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

\*GAGES

GATLING GUNS

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

INDUSTRIAL SOURCES  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT

GAS DYNAMICS

GATLING MECHANISMS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BROSSEAU, TIMOTHY  
DEAS, ROBERT  
GERBER, NATHAN  
SAMOS, GEORGE  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WALLEN, STUVIE C.

\*GAU-7/A AUTOMATIC GUN

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
PARTRIDGE, DANIEL A.

•GAU-7, 20MM

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
RUTLAND, J. ANDREW

•GLIDE VEHICLE TECHNOLOGY

INDUSTRIAL SOURCES

CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

•GAU-7, 25MM

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.  
MAINE, WALTER O.  
RUTLAND, J. ANDREW

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

GRENADE LAUNCHERS

•GAU-7, 56MM

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
RUTLAND, J. ANDREW

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCV.  
BAER, JOHN LARRY

D'ANDREA, JOSEPH A.

PICATINNY ARSENAL, MUCOM

CHASKES, LEON T.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

DUNCAN, ROBERT E.

ROCHA, JOHN G.

•GAU-8 SUPPORT

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES  
MCWILLAN, FRANCIS

INDUSTRIAL SOURCES

CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.  
MC EMONT CORPORATION, NEW ENGLAND GROUP

•GAU-5/A AUTOMATIC GUN

GRENADES

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
PARTRIDGE, DANIEL A.

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCV.  
BAER, JOHN LARRY

D'ANDREA, JOSEPH A.

ABERDEEN PROVING GROUND, TECOM

CRIDER, CHARLES L.

EDGEWOOD ARSENAL

MONAHAN, HUGH (JR.)

EDGEWOOD ARSENAL, CHEMICAL LAB.

FLATAU, ABRAHAM

PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.

DECAPRIO, LOUIS

SMITH, ROBERT C.

PICATINNY ARSENAL, MUCOM

RUTKOVSKY, HYMAN D.

•GAU-8, 30MM

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
MAINE, WALTER O.

INDUSTRIAL SOURCES

CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.



• GUERRILLA AND COUNTER GUERRILLA WARFARE

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
FULTON, CHARLES L.

• GUERRILLA WARFARE

INFORMATION HANDLING ACTIVITIES  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

• GUIDED MISSILE WARHEADS

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, WUCOM  
RUTKOVSKY, HYMAN D.

GUN AUXILIARY EQUIPMENT

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GAY, HERMAN PAUL  
ARMY MATERIAL COMMAND, HEADQUARTERS  
COSGROVE, THOMAS E.  
NAVAL ORDNANCE SYSTEMS COMMAND  
HICKS, ELMER L.

• GUN BARREL EROSION FIRING

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN

GUN BARREL MATERIALS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DIBENEDETTO, JOSEPH

GUN BARRELS

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
LAWRENCE, LARRY R.  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
MERRILL, EIG

GUN BARRELS (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
HAMMER, ALEXANDER (DR.)  
NORAUSKY, PATRICK H. (JR.)  
THOMSEN, DARREL  
WALLEN, STUVIE C.

INDUSTRIAL SOURCES  
THE M & R MANUFACTURING CO.

GUN COMPONENTS

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

• GUN DRILLING

INDUSTRIAL SOURCES  
THE M & R MANUFACTURING CO.

GUN FEED MECHANISMS

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.  
REED, FREDERICK P.

INFORMATION HANDLING ACTIVITIES  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

INDUSTRIAL SOURCES  
ARES, INC.  
CHRYSLER CORPORATION

• GUN LAUNCHED ROCKETS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.

•GUN LOADERS

INFORMATION HANDLING ACTIVITIES  
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•GUN LOW ALT. AIR DEF. SYST.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

•GUN MECHANISMS

•GUN TUBE VULNERABILITY

GOVERNMENT PERSONNEL  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
JOHNSON, HAROLD E  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.

GUN MOUNTS

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

GUN SIGHT ASSEMBLIES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)

GUN SIGHTS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

GUN STOCKS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
OFNER, ROBERT

•GUN SYSTEM DESIGN

INDUSTRIAL SOURCES  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
STRICKLAND, STANLEY W.

•GUNSHIP

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
MAINE, WALTER D.

•GUU-A/P(IMP)

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.

•GUU-4/P (IMP, STOCKLESS)

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN

•M 2 K RIFLE

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

HAND GUNS

INDUSTRIAL SOURCES  
D. B. WESSON COMPANY, INC.

HAND GUNS (CONT'D)

INDUSTRIAL SOURCES (CONT'D)  
HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.  
STURM, RUGER & CO., INC.

HAND WEAPONS

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

•HARDWARE MANUFACTURE

INDUSTRIAL SOURCES  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV

•HAZARD ANALYSIS

INDUSTRIAL SOURCES  
HERCULES INC., ALLEGANY BALLISTICS LAB.  
HERCULES INC., BACCHUS WORKS  
ITT RESEARCH INSTITUTE

HEAT TRANSFER

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
KAHN, HENRY  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LEFCO, WILLIAM (DR.)  
THOMSEN, DARREL

INDUSTRIAL SOURCES  
CALSPAN CORPORATION

•HEAT TRANSFER EFFECTS OF ADDITIVES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DEAS, ROBERT

•HEAT-RESISTANT PLASTICS

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.

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•HEAT-RESISTANT PROPELLANTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
VISNOV, MARTIN

•HELICOPTER WEAPONS SYSTEMS

GOVERNMENT PERSONNEL  
FORT RUCKER, COMBAT DEV. COMMAND, AVIATION AGENCY  
GARBARINI, JOHN

•HELIUM GUN

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVANETZ, CHARLES J.

•HIGH BULK DENSITY EXTRUDED PROPELLANTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

•HIGH ENERGY PROPELLANTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
VISNOV, MARTIN

INDUSTRIAL SOURCES  
HERCULES INC., BACCHUS WORKS

HIGH EXPLOSIVE AMMUNITION

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TEST CNTR  
DAVIS, DALE M.  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS  
SMITH, ROBERT C.

INFORMATION HANDLING ACTIVITIES  
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HIGH EXPLOSIVE INCENDIARY AMMUNITION

•HIGH SPEED X-RAY

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REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

•HIGH EXPLOSIVES RESEARCH

•HIGH STRENGTH ALLOYS

INDUSTRIAL SOURCES  
AAI CORPORATION,

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
VASILAKIS, JOHN D. (DR.)

•HIGH IMPETUS LOW TEMP LOW WEIGHT PROPELLANT

•HIGH TEMP. STABLE PROPELLANTS

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
HEINEY, OTTO K.

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
LANTZ, ROBERT

•HIGH RATE GUN

•HIGH VELOCITY GUNS

INDUSTRIAL SOURCES  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

•HIGH RATE WEAPONS

•HIGH VELOCITY SMALL BORE MILITARY/POLICE RIFLE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MAGARDO, ROBERT F.

INDUSTRIAL SOURCES  
STURM, RUGER & CO., INC.

•HIGH SPEED MEASUREMENTS

HIGH VELOCITY WEAPONS

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, MUCOM  
CONWAY, WILLIAM F.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MAGARDO, ROBERT F.

HIGH SPEED PHOTOGRAPHY

•HISPANO SUIZA

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BRAUN, WALTER F.  
KIRKENDALL, RICHARD  
WATERTOWN ARSENAL, AMHRC  
PETERS, JOSEPH R.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY

HOLOGRAPHY

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BOLDT, TERRY (DR.)

# HOLOGRAPHY (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

## •HOROLOGY

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
AMES, VERNON G.

## •HUEY CORRA ARMAMENT

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WALLEN, STUVIE C.

## HUMAN FACTORS

GOVERNMENT PERSONNEL  
FORT BENNING, COMBAT DEV. COMMAND INFANTRY AGCY.  
PRONE, JOSEPH F. (MAJ.)

## HUMAN FACTORS ENGINEERING

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
LENTZ, STANLEY  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBERTS, JOHN  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

## •HYPERVELOCITY AIRCRAFT CANNON DEVELOPMENT

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
HEINEY, OTTO K.

## •HYPERVELOCITY PENETRATION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

# •HYPERVELOCITY WEAPONRY

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK H. (JR.)

## •IDENTIFICATION OF FIRED PROJECTILES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

## •IGNITION

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
VISNOV, MARTIN

## •IGNITION CHEMISTRY

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
LANJON, JOSEPH A. (DR.)

## •ILLUMINATING CARTRIDGES

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

## •IMPROVED ALUMINUM ALLOYS

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
ISSEROW, SAUL (DR.)

## •IMPROVED 30MM AMMUNITION

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
REAGON, ROBERT

## INCAPACITATING AGENTS

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
SHAFF, LARRY T.

INDUCTION MELTING

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INFANTRY

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

•INFANTRY DOCTRINE

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

•INFANTRY EQUIPMENT

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

•INFANTRY ORGANIZATION

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

•INFANTRY REQUIREMENTS

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

•INFANTRY RIFLE UNIT STUDY

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

•INFANTRY SOCKETS (LAW)

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, MUCOM  
RUTKOVSKY, HYMAN D.

•INFANTRY SELECTED AMMUNITION PROGRAM

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, MUCOM  
CHASKES, LEON T.

INFANTRY TRAINING

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

•INFANTRY WEAPON SYSTEMS

GOVERNMENT PERSONNEL  
QUANTICO, MARINE CORPS DEV. AND EDUCATION COMMAND  
MARADA, JOSEPH P. (MAJ.)

INFANTRY WEAPONS

GOVERNMENT PERSONNEL  
MARINE CORPS, HQ, ORDINANCE BRANCH  
BLAIR, RICHARD R. (LT. COL.)  
QUANTICO, MARINE CORPS DEV. AND EDUCATION COMMAND  
MARADA, JOSEPH P. (MAJ.)

•INSTRUMENTATION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.  
PHELPS, JOHN D.

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

FULTON, CHARLES L.  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVANETZ, CHARLES J.

PICATINNY ARSENAL, MUCOM  
CONWAY, WILLIAM F.

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

# INTERIOR BALLISTICS

# INTERIOR BALLISTICS (CONT'D)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BAER, PAUL G.

DEAS, ROBERT  
GAY, HERMAN PAUL  
GREENE, ROBERT  
GROLLMAN, BERTRAM  
TRAFTON, THOMAS R.

WINFOLT, EMMA M.  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.  
JEZEK, BRUCE

KATSANIS, DAVID J. (DR.)  
CHINA LAKE, NAVAL WEAPONS CENTER  
ROMERT, EDUARD S.

EDGEWOOD ARSENAL  
MONCHAN, HUGH (JR.)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.  
HEINEY, OTTO K.

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BORNHEIM, GEORGE M.  
DICKEY, CHARLES M.  
GOLDSTEIN, SIDNEY

SCHUPP, WALTER  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
KAHN, HENRY

THILO, EDWARD R.  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

FULTON, CHARLES L.  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
LANTZ, ROBERT

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DUNCAN, ROBERT E.

INFORMATION HANDLING ACTIVITIES  
ABERDEEN PROVING GROUNDS, TECHNICAL LIBRARY

## INDUSTRIAL SOURCES

AAI CORPORATION,  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
CALSPAN CORPORATION  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
HERCULES INC., ALLEGANY BALLISTICS LAB.  
HERCULES INC., BACCHUS WORKS  
TST RESEARCH INSTITUTE

INDUSTRIAL SOURCES (CONT'D)  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

• INTERIOR BALLISTICS MATH MODELS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BAER, PAUL G.

• INTERIOR BALLISTICS OF SABOTED ROUNDS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DEAS, ROBERT

• INTERNATIONAL STANDARDIZATION

GOVERNMENT PERSONNEL  
ARMY MATERIAL COMMAND, HEADQUARTERS  
COSGROVE, THOMAS E.

• ISOCYANATE PLASTICS

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.

• ISOCYANATES

INDUSTRIAL SOURCES  
E. I. DUPONT DE NEMOURS & CO., ELASTOMER CHEM. DEP

• JET FLAME PRIMER

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
WHITE, WILMER

KINEMATIC ANALYSIS

INDUSTRIAL SOURCES  
WAREMONT CORPORATION, NEW ENGLAND GROUP

# KINEMATICS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
SCHUMACHER, CARROL

•LAMINATED PLASTICS

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.

•LANCE WARHEAD

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMRC  
RIFFIN, PAUL V.

# LASERS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

INFORMATION HANDLING ACTIVITIES  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

INDUSTRIAL SOURCES  
HERCULES INC., BACCHUS WORKS  
R & O ASSOCIATES

# LAUNCH BALLISTICS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

•LAW ENFORCEMENT ARMS PRODUCTS

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

•LESS LETHAL AMMUNITION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
LANDIS, ELMER

# LETHALITY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
LANDIS, ELMER

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVANETZ, CHARLES J.

PICATINNY ARSENAL, MUCOM  
MATZKOWITZ, WILLIAM

LIGHTWEIGHT ARMOR

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BAER, JOHN LARRY

•LIGHTWEIGHT CARTRIDGE CASES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
GRUNER, FREDERICK

•LIGHTWEIGHT FIGHTER GUN SYSTEM

GOVERNMENT PERSONNEL  
EGGINS AIR FORCE BASE, ARMAMENT DEV. AND TEST CNTR  
MAINE, WALTER O.

•LIGHTWEIGHT HIGH STRENGTH MATERIALS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
GRUNER, FREDERICK

•LIGHTWEIGHT RANGE FINDER

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)

•LIQUID PROPELLANT GUN AMMUNITION

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
WARD, JOHN S.



LIQUID PROPELLANT GUNS

CHINA LAKE, NAVAL WEAPONS CENTER  
ROMERO, EDUARDO S.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REYNOLDS, JOHN

•LOW ALT. FORWARD AIR DEF. SYST.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

•LOW LETHALITY SYSTEMS

INFORMATION HANDLING ACTIVITIES  
BATTILLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKIEY, CHARLES M.

LIQUID PROPELLANTS

•LOW LIGHT LEVEL SIGHTS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.  
CHINA LAKE, NAVAL WEAPONS CENTER  
WARD, JOHN S.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BYSURA, CARL J.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

•LOADING MACHINERY

•LOW MAINTENANCE MATERIAL RIFLE

INDUSTRIAL SOURCES  
PERRY INDUSTRIES, INC.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
FAGG, CHARLES R.

LOGISTICS

•LTWT. COMPANY MORTAR (LWCM)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, MAINTENANCE DIR.  
DORBECK, RICHARD J.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

LOGISTICS MANAGEMENT

•LTWT. RECOILLESS ANTITANK WPN. (SMANT)

GOVERNMENT PERSONNEL  
NAVAL ORDINANCE SYSTEMS COMMAND  
HICKS, ELMER L.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
UPSON, HARRY W. (JR.)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

LUBRICANTS

INFORMATION HANDLING ACTIVITIES  
FORT ORD, TECHNICAL LIBRARY

•LONG RECOIL WEAPONS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
GISSER, HENRY (DR.)  
MESSINA, JOSEPH

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

LUBRICANTS (CONT'D)

INFORMATION HANDLING ACTIVITIES  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

LUBRICATION

MACHINE GUNS (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB (CONT'D)  
ROCHA, JOHN G.  
THOMPSON, STANLEY R.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
GRUNER, FREDERICK

INDUSTRIAL SOURCES  
MAREMONT CORPORATION, NEW ENGLAND GROUP

1--37E1 TANK MACHINE GUN

MAGAZINE ASSEMBLIES

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
OFNER, ROBERT

MACHINE DESIGN

MAGAZINES (AMMUNITION)

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUN. IONS DEV. AND ENG. DIR.  
MARHGRAF, ROBERT N.

INDUSTRIAL SOURCES  
BORG-WARNER CORP., SPRING/BRUNNER DIVISION  
HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.

INDUSTRIAL SOURCES  
AAI CORPORATION,

MAINTAINABILITY

MACHINE GUN MOUNTS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, CDC MAINTENANCE AGCY.  
LEE, CLAYTON RICHARD

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
FERRETT, CHARLES S. (JR.)

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.

MACHINE GUNS

ROCK ISLAND ARSENAL, WECOM, MAINTENANCE DIR.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
HENRY, ROBERT S.  
UPSON, HARRY W. (JR.)

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.

BAER, JOHN LARRY  
FERRETT, CHARLES S. (JR.)

ABERDEEN PROVING GROUND, WECOM

CRIDER, CHARLES L.

NAVAL ORDNANCE SYSTEMS COMMAND

HICKS, ELMER L.

TODARO, DONALD G. (LCDR)

PICATINNY ARSENAL, WECOM

CHASKES, LEON T.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

MEYER, ARTHUR R.

REED, FREDERICK P.

INDUSTRIAL SOURCES

MAREMONT CORPORATION, NEW ENGLAND GROUP  
THE STANWICK CORP., STANWICK SYSTEMS ENGINEERING

MAN MACHINE SYSTEMS

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
LENTZ, STANLEY

MAN MACHINE SYSTEMS (CONT'D)

•MARKSMANSHIP INSTRUCTION

INFORMATION HANDLING ACTIVITIES  
FORT ORD, TECHNICAL LIBRARY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

MAN WEAPON INTERACTION

MATERIALS TECHNOLOGY

INFORMATION HANDLING ACTIVITIES  
FORT ORD, TECHNICAL LIBRARY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
GRUNER, FREDERICK  
ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
GOUGH, WILLIAM A.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
LAWRENCE, LARRY R.  
FRANKFORD ARSENAL, METALS ENGINEERING BR.  
CORRIE, JOHN D.  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
MIKULA, JAMES J.  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
QUITTMAN, WILLIAM  
NAVAL AMMUNITION DEPOT, RESEARCH AND DEV. DEPT.  
SMITH, PHILIP J.  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
MERRILL, EIG  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
FRITHARA, WILLIAM T. (DR.)  
GEMER, ROBERT  
WATERTOWN ARSENAL, AMMRC  
CHOU, SHUN-CHIN (DR.)  
DHER, STEPHAN J.  
GERICKE, OTTO R.  
ISSEROW, SAUL (DR.)  
RIFFIN, PAUL V.  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
VASILAKIS, JOHN D. (DR.)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
SCHUMACHER, CARROL

•MAN/WEAPON INTERFACE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

•MARINE CORPS INFANTRY WEAPONS

GOVERNMENT PERSONNEL  
MARINE CORPS, HQ, ORDINANCE BRANCH  
BLAIR, RICHARD R. (LT. COL.)

•MARINE CORPS REQUIREMENTS

GOVERNMENT PERSONNEL  
QUANTICO, MARINE CORPS DEV. AND EDUCATION COMMAND  
MARADA, JOSEPH P. (MAJ.)

•MARKSMANSHIP

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COPPER DATA CENTER  
WATERVLIET ARSENAL, TECH. INFORMATION SERVICES  
•MATH MODELING TO PREDICT CARTRIDGE PERFORMANCE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
FAGG, CHARLES R.  
LENZ, LUDWIG J.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
SCHLENNER, ROBERT J.

# MATHEMATICAL MODELING

## MECHANICAL TESTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
KAHN, HENRY

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

## MELTING

INDUSTRIAL SOURCES  
MAREMONT CORPORATION, NEW ENGLAND GROUP

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

# MATHEMATICAL MODELS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, AMSAA  
FALLIN, HERBERT (DR.)  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BAER, PAUL G.  
DEAS, ROBERT  
GERBER, NATHAN  
GREENE, ROBERT  
TRAFTON, THOMAS R.  
WINEHOLT, EMMA M.  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE  
EDGEWOOD ARSENAL  
MILLER, MILES C.  
EDGEWOOD ARSENAL, CHEMICAL LAB.  
FLATAU, ABRAHAM  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES  
HEINEY, O. J.  
STARLING, JAMES F.  
FORT BENNING, COMBAT DEV. COMMAND INFANTRY AGCY.  
PAGNE, JOSEPH F. (MAJ.)  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKEY, CHARLES M.  
GOLDSTEIN, SIDNEY  
SCHLENNER, ROBERT J.  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DUNCAN, ROBERT E.  
NORAUSKY, PATRICK H. (JR.)  
PRISCHMANN, CLINTON  
WATER TOWN ARSENAL, AMMRC  
CHOU, SHUN-CHIN (DR.)

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

## METAL CUTTING

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., METALS & CERAMICS INF. CN  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

## \*METAL FORMING

## INDUSTRIAL SOURCES

AMRON CORP  
GULF & WESTERN IND., ADVANCED DEV. & ENG. CTR.  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.  
THE BUD COMPANY, TECHNICAL CENTER

## \*METALLURGICAL TESTING

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., METALS & CERAMICS INF. CN

## METALLURGY

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, METALS ENGINEERING BR.  
CORRIE, JOHN D.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DIBENEDETTO, JOSEPH  
ERIHARA, WILLIAM T. (DR.)  
WATER TOWN ARSENAL, AMMRC  
RIFFIN, PAUL V.  
WATERVILLE ARSENAL, BENET WEAPONS LAB.  
PEPE, JOSEPH (DR.)

INDUSTRIAL SOURCES  
THE STANWICK CORP., STANWICK SYSTEMS ENGINEERING

2854

# METALLURGY (CONT'D)

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INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., METALS & CERAMICS INF. CN  
WATERVLIET ARSENAL, TECH. INFORMATION SERVICES

•MK22/0 20MM MEDIUM MACHINE GUN

GOVERNMENT PERSONNEL  
NAVAL ORDINANCE SYSTEMS COMMAND  
TODARO, DONALD G. (LCDR)

INDUSTRIAL SOURCES  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.

•MK29/0 20MM MEDIUM MACHINE GUN

## METALS

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
RIFFIN, PAUL V.

GOVERNMENT PERSONNEL  
NAVAL ORDINANCE SYSTEMS COMMAND  
TODARO, DONALD G. (LCDR)

•MK30/0 30MM LIGHTWEIGHT WEAPONS SYSTEM

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., METALS & CERAMICS INF. CN

GOVERNMENT PERSONNEL  
NAVAL ORDINANCE SYSTEMS COMMAND  
TODARO, DONALD G. (LCDR)

## •MICROBIOLOGY

•MODEL MAKING

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
TEITELL, LEONARD (DR.)

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., ILION RESEARCH DIV.

## •MILITARY VEHICLES

•MOLDED PROPELLANTS

INDUSTRIAL SOURCES  
CHRYSLER CORPORATION

INDUSTRIAL SOURCES  
BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.

•MINIAT PRESSURE TRANSDUCER

MOUNTS

GOVERNMENT PERSONNEL  
ABFRODEN PROVING GROUND, BALLISTICS RES. LAB.  
BROSSEAU, TIMOTHY

INDUSTRIAL SOURCES  
ARES, INC.

•MULTI-PURPOSE MACHINE GUN MOUNT

## •MINT-TAT

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.

•MULTIPLE FLECHETTE CARTRIDGES

## •MISS DISTANCE INDICATORS

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
JONES, ROBERT M.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHODES, CHARLES J.

•MULTIPLE FLECHETTE PUSHER AND PULLER SABOT CONCEPT

•M1 CARBINE, CAL. 223

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
SCHUPP, WALTER

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

•MULTIPLE FLECHETTE RIFLES

•M1 RIFLE, INSERT CONV. CAL. 30 TO 7.62 MM NATO

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
STRUVE, JOHN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
REAGON, ROBERT

•M129 GRENADE LAUNCHER

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHODES, CHARLES J.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ROCHA, JOHN G.

MUZZLE BRAKES

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

•M139

MUZZLE DEVICES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

•M14 RIFLE

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
POST, JOHN S.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

•MUZZLE EFFECTS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

•M14, M14A1 RIFLES

MUZZLE FLASH SUPPRESSORS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COLE, ALBERT A. JR.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

•M140 30MM MACHINE GUN

MUZZLE FLASH TESTS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
MEYER, ARTHUR R.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

•M16 BURST CONTROL DEVICE

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
OWEN, WILLIAM J. (MAJ)

•M16 NATIONAL MATCH RIFLE

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
SCHUMACHER, CARROL

•M16 RIFLE

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
BRUNTON, LOREN  
GRACE, HARLEY  
WOLFF, RUSSELL

•M16 STACK

GOVERNMENT PERSONNEL  
NAVAL AMMUNITION DEPOT, RESEARCH AND DEV. LEPT.  
SMITH, PHILIP J.

•M16A1 LASER TRAINING DEVICE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

•M16A1 LOW LIGHT LEVEL SIGHT

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

•M16A1 NATIONAL MATCH/SNIPEER CONVERSION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

•M16A1 PRODUCT IMPROVEMENT

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

•M16A1 RIFLE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GAY, HERMAN PAUL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
GRUNER, FREDERICK  
FORT BENNING, ARMY INFANTRY BOARD  
SHANAHAN, C.O.

FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
GULOSTEIN, SIDNEY  
MCHUGH, ROBERT J.  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ACKLEY, JAMES

COLE, ALBERT A. JR.  
FAGG, CHARLES R.  
GRACE, HARLEY  
HENRY, ROBERT S.  
PACKARD, CHARLES F.  
PRISCHMANN, CLINTON  
RHODES, CHARLES J.  
SCHUMACHER, CARROL  
WEIR, RAYMOND H.

•M16A1 RIM FIRE ADAPTER

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

•M16A1 SIMULATION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
WINEHOLT, EMMA M.

•M16A1 SUBCALIBER DEVICE

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BORD  
OWEN, WILLIAM J. (MAJ)

•M203GL TRAINING GRENADE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

•M16A1/MOD MICV FPM.

•M21 SNIPER RIFLE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKIVRIGAN, JAMES

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

•M19 RIFLE

•M219

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)

•M1911A1 PISTOL

•M219 MACHINE GUN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PRISCHMANN, CLINTON

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WEIR, RAYMOND H.

•M197 GUN

•M37A1

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
GULICK, LEONARD

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)

•M203 GRENADE

•M39 GUN, 20MM

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.

•M203 GRENADE LAUNCHER

•M60 MACHINE GUN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ACKLEY, JAMES  
COLE, ALBERT A. JR.  
GRACE, HARLEY  
HENRY, ROBERT S.  
PRISCHMANN, CLINTON  
RHODES, CHARLES J.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)  
HENRY, ROBERT S.  
REED, FREDERICK P.  
ROCHA, JOHN G.



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•M60 SERIES MACHINE GUNS, 7.62MM

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
GIBSON, WILMOT  
GILHOOLY, FRANCIS

•M60 SERIES TANKS

INDUSTRIAL SOURCES  
CHRYSLER CORPORATION

•M60D MACHINE GUN CONVERSION

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
MEYER, ARTHUR R.

•M61 GUN, 20MM

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
DAVIS, DALE M.

•M651 CS TACTICAL CARTRIDGE

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL  
MONAHAN, HUGH (JR.)

•M703 GRENADE

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

•M73 MACHINE GUN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.

•M73A1/M219 MACHINE GUN, 7.62MM

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ASH, DENNIS

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•M73A1/M219 MACHINE GUN, 7.62MM (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB (CONT'D)  
GIBSON, WILMOT  
HENRY, ROBERT S.

•M79

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS

•M79 GRENADE

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

•M79 HAND HELD GRENADE LAUNCHERS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.

•M80 SPOTTING RIFLE, CAL. .50

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
GIBSON, WILMOT  
GILHOOLY, FRANCIS  
HENRY, ROBERT S.

•M85 MACHINE GUN, CAL. .50

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ASH, DENNIS  
COLUT, VICTOR J. (MAJ GS)  
GIBSON, WILMOT  
HENRY, ROBERT S.  
REED, FREDERICK P.  
WEIR, RAYMOND H.

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•NASTRAN

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
O'HARA, GLEN P.

•NOISE SUPPRESSORS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.

•NAVAL WEAPONS SYSTEMS

NONDESTRUCTIVE TESTING

GOVERNMENT PERSONNEL  
NAVAL ORDNANCE SYSTEMS COMMAND  
TODARO, DONALD G. (LCDR)

•NAVY MK 100 SERIES 20MM AMMUNITION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
BERK, SIGMUND  
WATERTOWN ARSENAL, AMMRC  
GERICKE, OTTO R.

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
MILLER, PAUL H.

•NEOPRENE

INFORMATION HANDLING ACTIVITIES  
NONDESTRUCTIVE TESTING INFORMATION ANALYSIS CENTER  
•NONDESTRUCTIVE TESTS FOR COMPOSITE MATERIALS

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•NIGHT OBSERVATION DEVICES

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GERICKE, OTTO R.

INFORMATION HANDLING ACTIVITIES

FORT ORD, CDEC FIELD EXPERIMENTATION DATA BANK

•NONMETALLIC BELT LINKS

•NIGHT SIGHTS - RADAR AND RADIOACTIVE TYPE

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ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
OFNER, ROBERT

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.

•NONMETALLIC MATERIALS

•NIGHT VISION AND INFRARED SYSTEMS

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PICATINNY ARSENAL, FELTHAM RESEARCH LAB.  
MERRILL, EIG

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THE STANWICK CORP., STANWICK SYSTEMS ENGINEERING

•NOVEL ELECTRONICS WEAPON SIGHT (NEWS)

•NITRAMINE PROPELLANTS COMBUSTION

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ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

GOVERNMENT PERSONNEL  
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STIEFEL, LUDWIG

•OBTURATORS

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MERRILL, EIG

PACKAGING (CONT'D)

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•OPERATIONS RESEARCH

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COL. W. L. MCCULLA, CONSULTANT  
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•OPTIMUM PROJECTILE PROGRAM

•PACKAGING MACHINERY

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ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GROLLMAN, BERTRAM

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•ORDNANCE DEVELOPMENT AND TEST

•PACKAGING MATERIALS

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ORGANIC CHEMISTRY

•PARAMETRIC INVESTIGATION OF PROJECTILES

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SOLLOT, GILBERT P. (DR.)

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, CHEMICAL LAB.  
FLATAU, ABRAHAM

•ORGANIC MATERIALS

•PENETRATION MECHANICS

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PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
MERRILL, EIG

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FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

•ORGANOMETALLIC CHEMISTRY

PENETRATION TESTS

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SOLLOT, GILBERT P. (DR.)

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HERR, LOUIS  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
BALDINI, LUIGI F.

PACKAGING

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DICKNEY, CHARLES M.  
MARHGRAF, ROBERT N.

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ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
GOUGH, WILLIAM A.

PENETRATORS (CONT'D)

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 McMILLAN, FRANCIS  
 WATERTOWN ARSENAL, AMMRC  
 DOHERTY, STEPHAN J.

PIEZOELECTRIC GAUGES

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 ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
 PROSSEAU, TIMOTHY  
 PLASMA SPRAYING

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 BATTELLE MEMORIAL INST., COLUMBUS LAB.

• PERFORMANCE FIELD EXPERIMENTATION

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 BATTELLE MEMORIAL INST., COLUMBUS LAB.

INFORMATION HANDLING ACTIVITIES  
 FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

• PLASTIC BLANKS FOR M16

PERSONAL DEFENSE WEAPONS

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
 LANDIS, ELMER

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 MAGARDO, ROBERT F.  
 ROANE, LESTER

PLASTIC CARTRIDGE CASES

FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR.  
 MOWREY, FRED H.

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 BERSTEIN, CHARLES N.

BORNHEIM, GEORGE H.

SCHLENNER, ROBERT J.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

PRISCHMANN, CLINTON

SCHUMACHER, CARROL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
 ROBBINS, JOHN

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 DICKEY, CHARLES M.

• PHOTOELASTICITY

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
 NARDONE, JOHN  
 TITUS, JOAN

GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
 THILO, EDWARD R.

• PLASTIC JACKETED LARGE CAL. AMMUNITION

PHYSICAL SIMULATION

GOVERNMENT PERSONNEL  
 EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
 ROBBINS, JOHN

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, AMSAA

FALLIN, HERBERT (DR.)

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB

HAMMER, ALEXANDER (DR.)

• PLASTIC JACKETED SMALL CAL. AMMUNITION

GOVERNMENT PERSONNEL

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
 ROBBINS, JOHN

PLASTIC PROPERTIES

PLASTICS (CONT'D)

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OFNER, ROBERT

\*PLASTIC RIFLE STOCKS

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
OFNER, ROBERT

\*PLASTIC ROTATING BAND DEVELOPMENT

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\*PLASTIC TOOLING

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PLASTICS

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NAVAL AMMUNITION DEPOT, RESEARCH AND DEV. DEPT.  
SMITH, PHILIP J.

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NARDONE, JOHN  
TITUS, JOAN  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
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INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.

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\*PLASTIC RIFLE STOCKS

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SMITH, PHILIP J.

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.

NARDONE, JOHN  
TITUS, JOAN  
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OFNER, ROBERT

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MATSUGUMA, HAROLD J.

\*POLYESTER (AYTREL)

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DIBENEDETTO, JOSEPH  
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ISSEROW, SAUL (DR.)

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SAMOS, GEORGE  
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SHINDLER, CHARLES E.  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
KOWALICK, JAMES F. (DR.)  
WHITE, WILMER

•PRACTISE CARTRIDGES

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DECAPRIO, LOUIS  
SMITH, ROBERT C.

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PRESSURE GAUGES

•PRODUCTIBILITY STUDIES

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BROSSEAU, TIMOTHY  
DEAS, ROBERT

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•PRESSURE GRADIENTS, HIGH VEL. GUNS

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DEAS, ROBERT

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ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
BRUNTON, LOREN  
GIBSON, WILMOT  
GILHOOLY, FRANCIS  
HENRY, ROBERT S.

PRESSURE STRESS ANALYSIS

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
CHOU, SHUN-CHIN (DR.)  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
KENDALL, DAVID P.

INDUSTRIAL SOURCES  
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•PRODUCTION MILLING

PRESSURE TESTS

•PROJECT ALPHA

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

•PRIMER NO. 34

•PROJECT SALVO

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
WHITE, WILMER

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKEY, CHARLES M.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

•PROJECT THOR

GOVERNMENT PERSONNEL  
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CREWS, GEORGE

•PROJECTILE GROMMETS

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PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
NARDONE, JOHN

•PROJECTILE PERFORMANCE ANALYSIS

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EDGEWOOD ARSENAL  
MILLER, MILES G.

PROJECTILES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BYSURA, CARL J.  
JEZEK, BRUCE  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN  
WATERTOWN ARSENAL, AMMRC  
OCHERTY, STEPHAN J.

INDUSTRIAL SOURCES

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PROOF TEST DATA

INFORMATION HANDLING ACTIVITIES  
ABERDEEN PROVING GROUND, TECHNICAL LIBRARY  
FRANKFORD ARSENAL, TECHNICAL LIBRARY

PROOF TESTS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BROSSEAU, TIMOTHY  
ABERDEEN PROVING GROUND, TECOM  
PHELPS, JOHN O.

PROOF TESTS (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
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DYNAMUE, JAMES A.  
FULTON, CHARLES L.

•PROPELLANT ACTUATED DEVICES (PAD)

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FULTON, CHARLES L.

PROPELLANT CHEMISTRY

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ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
HEINNEY, OTTO K.  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
LANNON, JOSEPH A. (DR.)  
MIKULA, JAMES J.  
SOLLOTT, GILBERT P. (DR.)  
PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
LANTZ, ROBERT

•PROPELLANT MANUFACTURE

GOVERNMENT PERSONNEL  
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SHINDLER, CHARLES E.

•PROPELLANT THERMODYNAMICS

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BAER, PAUL G.

PROPELLANTS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
TRAFTON, THOMAS R.  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.

PROPELLANTS (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
 ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
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 FRANKFORD ARSENAL, MANUFACTURING TECHNOLOGY DIR.  
 SHINDLER, CHARLES E.  
 FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 DICKEY, CHARLES M.  
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INFORMATION HANDLING ACTIVITIES  
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INDUSTRIAL SOURCES  
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 HERCULES INC., BACCHUS WORKS  
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\*PROPELLANTS FOR MK100 SERIES AIRCRAFT AMMUNITION

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 RIFFIN, PAUL V.

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 SHINDLER, CHARLES E.  
 FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
 DORIS, THOMAS A. JR.  
 PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
 DECAPRID, LOUIS  
 SMITH, ROBERT C.  
 PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
 SHEFFIELD, OLIVER E.

INFORMATION HANDLING ACTIVITIES  
 PICATINNY ARSENAL, SCIENCE & TECH. INFORMATION BR.

INDUSTRIAL SOURCES  
 AAT CORPORATION  
 BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.  
 CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

QUALITY ASSURANCE

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 VIRENE, EDGAR (DR.)

QUALITY CONTROL

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
 BYSURA, CARL J.  
 ROANE, LESTER



# RADIOGRAPHY

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## RELIABILITY (CONT'D)

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILD, EDWARD R.

GOVERNMENT PERSONNEL (CONT'D)  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
VIRENE, EDGAR (DR.)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
HENRY, ROBERT S.

### \*RADIOISOTOPE GAUGES

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
BERK, SIGMUND

INDUSTRIAL SOURCES  
MAREMONT CORPORATION, NEW ENGLAND GROUP  
SYSTEMS CONSULTANTS INCORPORATED  
THE STANWICK CORP., STANWICK SYSTEMS ENGINEERING

### RAPID FIRE WEAPONS

#### \*REPLACEMENT BARRELS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY

INDUSTRIAL SOURCES  
MAREMONT CORPORATION, NEW ENGLAND GROUP

BROSSEAU, TIMOTHY  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
LINSAY, JOHN T. (LT. COL.)

#### \*RESINS

### RECOIL MECHANISMS

INDUSTRIAL SOURCES  
E. I. DUPONT DE NEMOURS & CO., PLASTICS DEPARTMENT  
E. I. DUPONT DE NEMOURS & CO., FLOURCARBONS DIV.  
REVOLVERS  
GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

INFORMATION HANDLING ACTIVITIES  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

INDUSTRIAL SOURCES  
D. B. WESSON COMPANY, INC.  
STURM, RUGER & CO., INC.

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CHRYSLER CORPORATION

#### \*RIFLE COMPONENTS

### RECOILLESS RIFLES

INDUSTRIAL SOURCES  
MAREMONT CORPORATION, NEW ENGLAND GROUP

#### \*RIFLE PACKAGING

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GREENE, ROBERT

RELIABILITY  
GOVERNMENT PERSONNEL  
NAVAL AMMUNITION DEPOT, RESEARCH AND DEV. DEPT.  
SMITH, PHILIP J.

#### RIFLES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, CDC MAINTENANCE AGCY.  
LEE, CLAYTON RICHARD  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
STRUVE, JOHN

RIFLES (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
 FORT BENNING, ARMY INFANTRY BOARD  
 SHANAHAN, C.O.  
 ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
 HAMMER, ALEXANDER (DR.)  
 WATERTOWN ARSENAL, AMMRC  
 RIFFIN, PAUL V.

ROCKET MOTORS

INDUSTRIAL SOURCES  
 HERCULES INC., ALLEGANY BALLISTICS LAB.

ROCKETS

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
 GREENE, ROBERT  
 EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
 LINSAY, JOHN T. (LT. COL.)  
 PICATINNY ARSENAL, MUCOM  
 RUTKOVSKY, HYMAN D.

RAINFIRE PISTOLS

ROTATING BANDS

INDUSTRIAL SOURCES  
 STURM, RUGER & CO., INC.

RING AIRFOIL GRENADE

GOVERNMENT PERSONNEL  
 EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
 BILSBURY, STEPHEN J. (MAJ.)  
 PICATINNY ARSENAL, FELTHAM RESEARCH LAB.  
 MERRILL, EIG  
 NARDONE, JOHN  
 TITUS, JOAN  
 WATERTOWN ARSENAL, AMMRC  
 DOWERTY, STEPHAN J.

RING AIRFOIL GRENADE LAUNCHER

RUBBER

GOVERNMENT PERSONNEL  
 ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
 POST, JOHN S.

GOVERNMENT PERSONNEL  
 ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
 OFNER, ROBERT

RIOT CONTROL CARTRIDGES

GOVERNMENT PERSONNEL  
 EDGEWOOD ARSENAL  
 HONOHAN, HUGH (JR.)

INDUSTRIAL SOURCES  
 HERCULES INC., ALLEGANY BALLISTICS LAB.

SABOTED PROJECTILES

RIOT CONTROL WEAPONS

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
 DEAS, ROBERT  
 SABOTIS  
 GOVERNMENT PERSONNEL  
 EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
 SHAFF, LARRY T.

GOVERNMENT PERSONNEL  
 ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
 DEAS, ROBERT

SABOTS (CONT'D)

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•SEAS

GOVERNMENT PERSONNEL (CONT'D)  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.

STRUVE, JOHN

THOMPSON, JOSEPH F.

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.

MINCINI, ANGEL N. (JR.)

SCHUPP, WALTER

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.

BALDINI, LUIGI F.

WATERTOWN ARSENAL, AMRC

DOHERTY, STEPHAN J.

•SAFE AND ARMING DEVICES

INDUSTRIAL SOURCES  
BULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

•SALVO AMMUNITION & EFFECTIVENESS

•SERIAL BULLET RIFLE

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.

JEZEK, BRUCE

•SATIN (SMALL ARMS TECHNICAL INFORMATION NETWORK)

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.

BYSTURA, CARL J.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
STRUVE, JOHN  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
REAGON, ROBERT

•SERIAL BULLET RIFLE/FULL BORE, SABOT BULLET

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

•SCAMP

•SERIAL FLECHETTE RIFLE

GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, MANUFACTURING TECHNOLOGY DIR.

PENN, HARRY G.

•SCANNING ELECTRON MICROSCOPY

•SERIAL FLECHETTE RIFLE AMMUNITION PRODUCTION

GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, METALS ENGINEERING RR.  
CORRIE, JOHN D.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
THOMPSON, JOSEPH F.

\*SERVICE TESTING

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

\*SHOCK WAVE STUDIES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
LANDIS, ELMER  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
ROBBINS, JOHN  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.  
LORENZEN, THEODORE G.  
POST, JOHN S.

SHOP MAINTENANCE

\*SILENT WEAPON SYSTEM

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, MAINTENANCE DIR.  
DORBECK, RICHARD J.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
UPSON, HARRY W. (JR.)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

SHOT GUNS

\*SINGLE ACTION REVOLVERS

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

INDUSTRIAL SOURCES  
STURM, RUGER & CO., INC.

SHOULDER WEAPONS

\*SMALL ARMS AMMUNITION FUZES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
CRIDER, CHARLES L.  
ARMY MATERIAL COMMAND, HEADQUARTERS  
COSGROVE, THOMAS E.  
ARMY RES. AND DEV.  
SHELTON, HENRY R. (COL.)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

GOVERNMENT PERSONNEL  
FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR  
SNOPEK, ROBERT G.

\*SMALL ARMS ASSEMBLIES

INDUSTRIAL SOURCES  
THE H & R MANUFACTURING CO.

\*SIGNALING CARTRIDGES

SMALL ARMS DESIGN

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS  
SMITH, ROBERT C.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
MEYER, ARTHUR R.  
PACKARD, CHARLES F.  
PRISCHMANN, CLINTON  
REED, FREDERICK P.  
SCHUMACHER, CARROL  
THOMPSON, STANLEY R.  
WEIR, RAYMOND H.

\*SILENCED WEAPONS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
LANDIS, ELMER

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SMALL ARMS DESIGN (CONT'D)

\*SMALL CALIBER AMMUNITION MODERNIZATION PROGRAM

INDUSTRIAL SOURCES

AAI CORPORATION,  
ARES, INC.  
GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MANUFACTURING TECHNOLOGY DIR.  
PENN, HARRY G.

COLT INDUSTRIES OPERATING CORP., FIREARMS DIV.  
D. B. WESSON COMPANY, INC.  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.  
HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.  
REMINGTON ARMS CO., INC., ILION RESEARCH DIV.  
STURM, RUGER & CO., INC.  
THE BELLMORE-JOHNSON TOOL CO.

\*SMALL MECHANISM DESIGN

INDUSTRIAL SOURCES  
COLT INDUSTRIES OPERATING CORP., FIREARMS DIV.  
\*SMOKE EMITTING CARTRIDGES

\*SMALL ARMS SIGHTING SYSTEMS (DAY, NIGHT)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)  
GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

\*SMALL ARMS TECHNICAL INFORMATION NETWORK (SATIN)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BYSURA, CARL J.  
GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

SOLID PROPELLANTS

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

\*SMALL ARMS TEST DATA ANALYSIS  
GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
OWEN, WILLIAM J. (MAJ)  
GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
VISNOV, MARTIN

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
OWEN, WILLIAM J. (MAJ)

INDUSTRIAL SOURCES  
HERCULES INC., ALLEGANY BALLISTICS LAB.

\*SMALL ARMS TRAINING DEVICES

\*SPALL GENERATION

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, MAINTENANCE DIR.  
DORBECK, RICHARD J.

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMHRC  
PETERS, JOSEPH R.

\*SMALL ARMS WEAPONS SYSTEMS STUDY

\*SPARK SINTERING OF CERAMIC AND METAL POWDER

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (Jr.)

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMHRC  
ISSEROW, SAUL (DR.)

SPECIAL APPLICATIONS MATERIALS

SPECTROSCOPY

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
ISSEROW, SAUL (DR.)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCKOWN, GARY (DR.)  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
LANNON, JOSEPH A. (DR.)  
MIKULA, JAMES J.

INDUSTRIAL SOURCES  
E. I. DUPONT DE NUMOURS & CO., FLOUROCARBONS DIV.

SPIV STABILIZED AMMUNITION

\*SPECIAL ORDINANCE DEVICES

INDUSTRIAL SOURCES  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.  
GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
KATSANIS, DAVID J. (DR.)  
\*SPECIAL PURPOSE INDIVIDUAL WEAPON (SPIW)  
\*SPIW (XM 19)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GAY, HERMAN PAUL  
ARMY RES. AND DEV.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
SAMOS, GEORGE

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
SHELTON, HENRY R. (COL.)  
REED, FREDERICK P.

\*SPIW TESTS

ROCHA, JOHN G.  
WEIR, RAYMOND H.  
WATERTOWN ARSENAL, AMMRC  
DOHERTY, STEPHAN J.

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

\*SPECIAL PURPOSE PRESSES

\*SPORTING ARMS AND AMMUNITION

INDUSTRIAL SOURCES  
GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

\*SPECIAL PURPOSE WARHEADS

\*SQUAD AUTOMATIC WEAPON (SAW)

INDUSTRIAL SOURCES  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, CDC MAINTENANCE AGCY.  
LEE, CLAYTON RICHARD  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BAER, JOHN LARRY  
FERRETT, CHARLES S. (JR.)  
GRUNER, FREDERICK  
MCKIVRIGAN, JAMES  
ROANE, LESTER  
ARMY MATERIAL COMMAND, HEADQUARTERS  
COSGROVE, THOMAS E.  
FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR.  
MOWREY, FRED M.

\*SPECIALTY DEVICES

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, LAND WARFARE LAB.  
LANDIS, ELMER

*SQUAD AUTOMATIC WEAPON (SAW) (CONT'D)	301	STRESS ANALYSIS (CONT'D)
GOVERNMENT PERSONNEL (CONT'D)		GOVERNMENT PERSONNEL (CONT'D)
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.		WATERTOWN ARSENAL, AMMRC
BORNHEIM, GEORGE H.		CHAIT, RICHARD
DORIS, THOMAS A. JR.		WATERVLIET ARSENAL, BENET WEAPONS LAB.
SCHLENNER, ROBERT J.		O'HARA, GLEN P.
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB		
LEECH, WILLIAM (DR.)		INDUSTRIAL SOURCES
LEVZ, LUDWIG J.		HERCULES INC., BACCHUS WORKS
MEYER, ARTHUR R.		MAREMONT CORPORATION, NEW ENGLAND GROUP
THOMPSON, STANLEY R.		*STRESS ANALYSIS OF AN AIR FORCE REEL PALLET
VAUGHAN, EDWIN M.		
WEIR, RAYMOND H.		
*STAMPING & COINING		
INDUSTRIAL SOURCES		GOVERNMENT PERSONNEL
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.		WATERVLIET ARSENAL, BENET WEAPONS LAB.
		O'HARA, GLEN P.
*STEEL CARTRIDGE CASES		STRESS CORROSION
GOVERNMENT PERSONNEL		
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.		GOVERNMENT PERSONNEL
RYSUBA, CARL J.		FRANKFORD ARSENAL, PITMAN-DUNN LAB.
		PEARLSTEIN, FRED
*STOVER WEAPONS SYSTEMS		*STRUCTURAL ANALYSIS
		INDUSTRIAL SOURCES
GOVERNMENT PERSONNEL		AAT CORPORATION,
FORT BENNING, ARMY INFANTRY CENTER		SUBMACHINE GUNS
ROBERTS, EARL D. (JR.)		
STRAIN RATE EFFECTS		INDUSTRIAL SOURCES
		HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.
GOVERNMENT PERSONNEL		
WATERTOWN ARSENAL, AMMRC		*SURFACE PROTECTION COATINGS
CHOU, SHUN-CHIN (DR.)		
RIFFIN, PAUL V.		INDUSTRIAL SOURCES
WATERVLIET ARSENAL, BENET WEAPONS LAB.		AMRON CORP
KENDALL, DAVID P.		
STRESS ANALYSIS		*SWAGE AUTOFRETTAGE MANDRELS
GOVERNMENT PERSONNEL		
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB		GOVERNMENT PERSONNEL
DUNCAN, ROBERT E.		WATERVLIET ARSENAL, BENET WEAPONS LAB.
HAMMER, ALEXANDER (DR.)		O'HARA, GLEN P.

# SWAGING

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
O'MARA, GLEN P.

## SYSTEMS ANALYSIS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
KATSANIS, DAVID J. (DR.)  
FORT BENNING, COMBAT DEV. COMMAND INFANTRY AGCY.  
PAONE, JOSEPH F. (MAJ.)

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.  
BATTELLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

## SYSTEMS EFFECTIVENESS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
REAGAN, ROBERT

## TACTICAL WARFARE

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., TACTICAL TECHNOLOGY CNTR.

INDUSTRIAL SOURCES  
R & D ASSOCIATES

## \*TACTICAL WEAPONS

INDUSTRIAL SOURCES  
CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.

## \*TAMAS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

# TARGET VULNERABILITY

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
RUTLAND, J. ANDREW  
WINGER, JACK

EGLIN AIRFORCE BASE, ARMAMENT DEV. AND TST CNTR  
CADIEUX, RONALD (MAJ.)  
CREWS, GEORGE

## TARGETS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

INDUSTRIAL SOURCES  
CELESCO INDUSTRIES INC., MISSILE AND SPACE DIV.  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

## TECHNICAL DATA PACKAGES (TDP)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ASH, DENNIS  
COLE, ALBERT A. JR.  
GIBSON, WILMOT  
GILMOODY, FRANCIS

## \*TEFLON FLUOROCARBON RESINS AND FILMS

INDUSTRIAL SOURCES  
E. I. DUPONT DE NUMOURS & CO., FLUOROCARBONS DIV.

## \*TEFZEL FLUOROPOLYMER RESINS AND FILMS

INDUSTRIAL SOURCES  
E. I. DUPONT DE NUMOURS & CO., FLUOROCARBONS DIV.

## \*TELECARTRIDGE PROGRAM (40MM)

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
HAYNER, MICHAEL



# TEMPERATURE EFFECTS

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## TERMINAL EFFECTS

### GOVERNMENT PERSONNEL

WATERTOWN ARSENAL, AMMRC  
CHOU, SHUN-CHIN (DR.)  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
PEPE, JOSEPH (DR.)

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES  
MCMILLAN, FRANCIS

### TERMINAL BALLISTICS

RUTLAND, J. ANDREW  
EGLIN AIRFORCE BASE, ARMAMENT DEV. AND TST CNTR  
CADIEUX, RONALD (MAJ.)  
CREWS, GEORGE

WATERTOWN ARSENAL, AMMRC  
PETERS, JOSEPH R.

### GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
HERR, LOUIS  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
KATSANIS, DAVID J. (DR.)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
STRICKLAND, STANLEY W.  
WINGER, JACK

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
HERR, LOUIS

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BORNHEIM, GEORGE H.  
DICKY, CHARLES M.  
REAGON, ROBERT

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

SCHLENNER, ROBERT J.  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
HEINEY, OTTO K.

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
BALDINI, LUIGI F.  
DONAHUE, JAMES A.

FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
FULTON, CHARLES L.

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.  
HOVANETZ, CHARLES J.

PICATINNY ARSENAL, FELTMAN RESEARCH LAB.

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
DJNCPM, ROBERT E.

PICATINNY ARSENAL, MUCOM  
CONWAY, WILLIAM F.

WATERTOWN ARSENAL, AMMRC  
DOHERTY, STEPHAN J.

INDUSTRIAL SOURCES  
S. J. CONSULTANTS INCORPORATED

PETERS, JOSEPH R.

WRIGHT PATTERSON AFB, FLIGHT DYNAMICS LAB.  
CRUZE, CHARLES D.

## TEST INSTRUMENTATION

INFORMATION HANDLING ACTIVITIES  
ABERDEEN PROVING GROUND, TECHNICAL LIBRARY

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

### INDUSTRIAL SOURCES

AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
HERCULES INC., BACCHUS WORKS  
ITT RESEARCH INSTITUTE  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

## TEST RANGE AUTOMATION

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
JONES, ROBERT M.

TEST RANGES

•THERMOPLASTICS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
PHELPS, JOHN D.  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
FULTON, CHARLES L.

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.  
•THERMOSETTING PLASTICS

•TESTING AND ANALYSIS

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., ILION RESEARCH DIV.

INFORMATION HANDLING ACTIVITIES  
PICATINNY ARSENAL, PLASTICS TECH. EVALUATION CNTR.  
THERODYNAMICS

•TESTING OF CYLINDERS UNDER RAPID FIRE SIMULATION

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
VASILAKIS, JOHN D. (DR.)

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GERBER, NATHAN

•THICK-WALLED CYLINDER THEORY

•THERMAL INSTRUMENTATION

INDUSTRIAL SOURCES  
CALSPAN CORPORATION

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
KENDALL, DAVID P.

•TI ALLOYS

THERMAL STRESS ANALYSIS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LEECH, WILLIAM (DR.)  
WATERTOWN ARSENAL, AMMRC  
CHOU, SHUN-CHIN (DR.)

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
CHAIT, RICHARD

•TI-BE COMPOSITES

THERMODYNAMICS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BAER, PAUL G.  
DEAS, ROBERT

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
ISSEROW, SAUL (DR.)

•TIMERS

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
KATSANIS, DAVID J. (DR.)  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
KAHN, HENRY

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
AMES, VERNON G.

•TIMING DEVICES

INDUSTRIAL SOURCES  
CALSPAN CORPORATION

INDUSTRIAL SOURCES  
BULOVA WATCH COMPANY, INC., SYSTEMS & INST. DIV.

# TIMING FUZES

## TRACERS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
AVES, VERNON G.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
BERSTEIN, CHARLES N.

### \*TOOLING

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BYSURA, CARL J.  
DORIS, THOMAS A. JR.  
KOWALICK, JAMES F. (DR.)

### INDUSTRIAL SOURCES

GULF + WESTERN IND., ADVANCED DEV. & ENG. CTR.

### \*TRAINING DEVICES

### \*TOOLS

INDUSTRIAL SOURCES  
THE BELL MORE-JOHNSON TOOL CO.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
ROANE, LESTER  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.

### \*TOW

## TRANSITION BALLISTICS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

### \*TOXICITY OF WEAPONS EXHAUST

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
STIEFEL, LUDWIG

### TRACER AMMUNITION

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
BOLOY, TERRY (DR.)  
BORNHUEN, GEORGE H.  
DICKIE, CHARLES M.  
REASON, ROBERT  
SCHUPP, WALTER  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.  
FRANKFORD ARSENAL, TECHNICAL SUPPORT DIR.  
DONAHUE, JAMES A.

### \*TROPICALIZATION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
TEITELL, LEONARD (DR.)

### \*TRACER FLECHETTES

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
MINCINI, ANGELO N. (JR.)  
SCHUPP, WALTER

### \*TRUCK VULNERABILITY

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
WINGER, JACK

### \*TRACER PROJECTILE DESIGN

\*TRW6425

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
SCHLENNER, ROBERT J.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY

•T44 RIFLE

VAPOR DEPOSITION (CONT'D)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

INDUSTRIAL SOURCES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

•T48 RIFLE

•VARIABLE BIAS IN TANK GUNS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DEAS, ROBERT

•ULTRASONIC SPECTROSCOPY

•VARIABLE RATE OF FIRE WEAPONS SYSTEMS

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
GERICKE, OTTO R.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GAY, HERMAN PAUL

•UNUSUAL BULLET STUDY

•VEHICLE GUNS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
HERR, LOUIS

INDUSTRIAL SOURCES  
HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.

VELOCITY TESTS

•URETHANE (ADIPRENE)

INDUSTRIAL SOURCES

E. I. DUPONT DE NEMOURS & CO., ELASTOMER CHEM. DEP

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.  
ABERDEEN PROVING GROUND, TECOM  
MILWAY, WILLIAM B.

•VADS

VIBRATION RESEARCH

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DORIS, THOMAS A. JR.

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY

VALVE ENGINEERING

•VULCAN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
HENRY, ROBERT S.

INDUSTRIAL SOURCES  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT

VAPOR DEPOSITION

•VULCAN DEFENSE SYSTEM

INFORMATION HANDLING ACTIVITIES  
BATTELLE MEMORIAL INST., COLUMBUS LAB.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

•VULCAN AIR DEFENSE SYSTEM, MOTION ANALYSIS

310

WEAPON DYNAMICS (CONT'D)

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
KIRKENDALL, RICHARD

VULNERABILITY

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TEST CNTR  
FLINT, JAMES  
MCILLAN, FRANCES  
STRICKLAND, STANLEY W.  
WINGER, JACK

INDUSTRIAL SOURCES

CALSPAN CORPORATION  
CHAMBERLAIN MANUFACTURING CORP., RES. & DEV. DIV.  
•VULNERABILITY TESTING OF AIRCRAFT & VEHICLE COMPO

GOVERNMENT PERSONNEL (CONT'D)  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB (CONT'D)  
NEED, FREDERICK P.  
RHODES, CHARLES J.  
SCHUMACHER, CARROL  
WEIR, RAYMOND H.

WEAPON FABRICATION

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
DOANE, LESTER  
PITATINNY ARSENAL, WUCOM  
RUTKOVSKY, HYMAN D.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ASH, DENNIS  
COLE, ALBERT A. JR.  
GIBSON, WILNOT  
GILHOOLY, FRANCES  
HENRY, ROBERT S.

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

WEAPON DYNAMICS

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY  
BROSseau, TIMOTHY  
KIRKENDALL, RICHARD  
LENTZ, STANLEY

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.

ARMY FOREIGN SCIENCE AND TECHNOLOGY CENTER  
JOHNSON, HAROLD E

EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TEST CNTR  
DAVIS, DALE W.  
ROBBINS, JOHN

FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.

GOLDSTEIN, STONEY  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
BUTTERWORTH, DONALD S.

FAGG, CHARLES R.  
HAMMER, ALEXANDER FOR. I  
LORENZEN, THEODORE G.

INDUSTRIAL SOURCES

AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
COL. W. L. MCCULLA, CONSULTANT  
COLT INDUSTRIES OPERATING CORP., FIREARMS DIV.  
GENERAL AMERICAN TRANS. CORP., GEN. AMER. RES. DIV.  
GENERAL ELECTRIC CO., ARMAMENT SYSTEMS DEPARTMENT  
GENERAL MOTORS CORP., DELCO ELECTRONICS DIV.  
KEMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.  
STURM, RUGER & CO., INC.  
THE H & R MANUFACTURING CO.

WEAPON FIRING MECHANISMS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
BUTTERWORTH, DONALD S.

WEAPON MECHANISMS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
MCNIVAN, JAMES

\*WEAPON MIXES

INFORMATION HANDLING ACTIVITIES  
FORT ORD, COEC FIELD EXPERIMENTATION DATA BANK

WEAPONS

INDUSTRIAL SOURCES  
AAT CORPORATION,

WEAPON MOUNTS

\*WEAPONS ANALYSIS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
GAY, HERMAN PAUL  
KIRKENDALL, RICHARD  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
FERRETT, CHARLES S. (JR.)  
NAVAL ORDINANCE SYSTEMS COMMAND  
HICKS, ELMER L.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
HAMMER, ALEXANDER (DR.)

INDUSTRIAL SOURCES  
R & D ASSOCIATES

\*WEAPONS DESIGN

INDUSTRIAL SOURCES  
ITT RESEARCH INSTITUTE  
\*WEAPONS EFFECTIVENESS

INFORMATION HANDLING ACTIVITIES  
EGLIN AIR FORCE BASE, TECHNICAL LIBRARY  
ROCK ISLAND ARSENAL, TECHNICAL LIBRARY

INDUSTRIAL SOURCES  
R & D ASSOCIATES

WEAPONS EFFECTS

INDUSTRIAL SOURCES  
CHRYSLER CORPORATION

WEAPON SYSTEMS

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, AMSAA  
FALLIN, HERBERT (DR.)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
MAINE, WALTER D.  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHODES, CHARLES J.  
ROCHA, JOHN G.

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, AMSAA  
FALLIN, HERBERT (DR.)  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES  
MAINE, WALTER D.  
STARLING, JAMES F.  
STRICKLAND, STANLEY W.  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
CADIEUX, RONALD (MAJ.)  
FORT BENNING, COMBAT DEV. COMMAND INFANTRY AGCY.  
PADONE, JOSEPH F. (MAJ.)  
PICATINNY ARSENAL, MUCOM  
MATZKOWITZ, WILLIAM

INDUSTRIAL SOURCES  
AAI CORPORATION,  
PHILCO-FORD CORPORATION, AERONUTRONIC DIV.

WEAPONS TESTS

\*WEAPON SYSTEMS ANALYSIS

INDUSTRIAL SOURCES  
SYSTEMS CONSULTANTS INCORPORATED

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, TECOM  
CRIDER, CHARLES L.  
PHELPS, JOHN D.  
CHINA LAKE, NAVAL WEAPONS CENTER  
BATES, JACK  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
PARTRIDGE, DANIEL A.  
STRICKLAND, STANLEY W.

WEAPONS TESTS (CONT'D)

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WOUND BALLISTICS (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)

GOVERNMENT PERSONNEL (CONT'D)  
FRANKFORD ARSENAL, MUNITIONS DEV. AND ENG. DIR.  
DICKIEY, CHARLES M.

EGLIN AIRFORCE BASE, ARMAMENT DEV. AND TST CNTR  
CADIJEUX, RONALD (MAJ.)

FORT BENNING, ARMY INFANTRY BOARD  
OWEN, WILLIAM J. (MAJ)

SHANAHAN, C.O.

FORT RENNING, ARMY INFANTRY CENTER  
ROBERTS, EARL D. (JR.)

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ACKLEY, JAMES

DUNCAN, ROBERT E.

NORRAUSKY, PATRICK H. (JR.)

REED, FREDERICK P.

X RAY RADIOGRAPHY

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
HERR, LOUIS

X-RAY RADIOGRAPHY

\*WEAR RESISTANT COATINGS

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
PEARLSTEIN, FRED

\*WECOM 30

INDUSTRIAL SOURCES  
REMINGTON ARMS CO., INC., BRIDGEPORT RESEARCH DIV.

GOVERNMENT PERSONNEL  
FRANKFORD ARSENAL, PITMAN-DUNN LAB.  
THILO, EDWARD R.

WELDING

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

\*XM 204 SOFT RECOIL

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
PEPE, JOSEPH (DR.)

\*XM122 SPOTTING RIFLE

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.

\*WORLD WAR II SMALL ARMS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COLE, ALBERT A. JR.

\*XM128 GRENADE

WOUND BALLISTICS

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

GOVERNMENT PERSONNEL

\*XM138 155", LI WT SP HOWITZER

ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
DONNELLY, EMMET F.

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
JEZEK, BRUCE

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PRISCHMANN, CLINTON

\*XM140

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, BALLISTICS RES. LAB.  
BARAN, ANTHONY  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NDRAUSKY, PATRICK H. (JR.)  
VAUGHAN, EDWIN M.

\*XM173 LOW/HIGH VEL. HAND CRANK GREN. LAUNCHERS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

\*XM174

\*XM140 GRENADE

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
SMITH, ROBERT C.

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WEIR, RAYMOND H.

\*XM140 GRENADE LAUNCHER

\*XM174 HAND HELD GRENADE LAUNCHERS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ROCHA, JOHN G.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.

\*XM140 MACHINE GUN

\*XM175

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.  
VAUGHAN, EDWIN M.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WEIR, RAYMOND H.

\*XM19 MACHINE GUN

\*XM140 30MM AIRCRAFT CANNON

GOVERNMENT PERSONNEL  
ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
GRUNER, FREDERICK

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WEIR, RAYMOND H.

\*XM19 RIFLE

\*XM15 GENERAL OFFICERS PISTOL

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
SCHUMACHER, CARROL

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
FAGG, CHARLES R.  
RHODES, CHARLES J.

\*XM172 LOW/HIGH VEL. HAND CRANK GREN. LAUNCHERS

\*XM19 RIFLE MUZZLE DEVICE

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LENZ, LUDWIG J.



\*XM199 SCREW BLOCK BREECH

314

\*105MM APDS AND HEAT PROJECTILE MATERIALS

GOVERNMENT PERSONNEL  
WATERVLIET ARSENAL, BENET WEAPONS LAB.  
O'HARA, GLEN P.

GOVERNMENT PERSONNEL  
WATERTOWN ARSENAL, AMMRC  
RIFFIN, PAUL V.

\*XM23 AND XM24 HELICOPTER MOUNTS

\*12 GAGE POLICE RIOT PUMP GUN COMB. SHOT GUN

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
MEYER, ARTHUR R.

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

\*XM627 CS RIOT CONTROL CARTRIDGE 40MM GRENADE

\*155MM SP HOWITZER M109A1

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL  
MCNOYAN, HUGH (JR.)

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

\*XM645 CARTRIDGE

\*20MM AIRCRAFT GUN MK11

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHOADES, CHARLES J.

GOVERNMENT PERSONNEL  
NAVAL AIR SYSTEMS COMMAND  
SAUBER, JOHN

\*XM8 SPOTTING RIFLE

\*20MM AIRCRAFT GUN M197

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
REED, FREDERICK P.

GOVERNMENT PERSONNEL  
NAVAL AIR SYSTEMS COMMAND  
SAUBER, JOHN

\*XM90 SPOTTING RIFLE

\*20MM AIRCRAFT GUN PDD GPU-7/A

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
PACKARD, CHARLES F.

GOVERNMENT PERSONNEL  
NAVAL AIR SYSTEMS COMMAND  
SAUBER, JOHN

\*YAW ANALYSIS 37MM-105MM WEAPONS

\*20MM AIRCRAFT GUN PDD MK4

GOVERNMENT PERSONNEL  
ARFRODEN PROVING GROUND, BALLISTICS RES. LAB.  
KIRKENDALL, RICHARD

GOVERNMENT PERSONNEL  
NAVAL AIR SYSTEMS COMMAND  
SAURER, JOHN

\*2YTEL NYLON RESINS

\*20MM EFFECTIVENESS STUDIES (TRI-SVC.)

INDUSTRIAL SOURCES  
E. I. DUPONT DE NEMOURS & CO., PLASTICS DEPARTMENT

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES

\*20MM FLECHETTES

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
MCMILLAN, FRANCIS

\*20MM PROJECTILES

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
\*20MM STANDARD SERVICE ROUND (SSR)

\*20MM GENERAL PURPOSE PROJECTILE

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
GULICK, LEONARD

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
WARD, JOHN S.

\*20MM GENERAL PURPOSE PROJECTILES

\*20MM-40MM AMMUNITION

GOVERNMENT PERSONNEL  
NAVAL AIR SYSTEMS COMMAND  
SAUBER, JOHN

INDUSTRIAL SOURCES  
AMRON CORP

\*25MM BUSHMASTER

\*20MM GUNS

INDUSTRIAL SOURCES  
HEINRICH VON WIMMERSBERG, DEVELOPMENT ENG.

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
\*25MM CASELESS AMMUNITION

\*20MM LIGHTWEIGHT GUN POD

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
GULICK, LEONARD

INDUSTRIAL SOURCES  
BRUNSWICK CORPORATION, TECHNICAL PRODUCTS DIV.  
\*25MM GAU-7

\*20MM LIGHTWEIGHT GUN POD GPU 2/A

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
BATES, JACK

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.  
\*25MM LIQUID PROPELLANT GUN SYSTEM

\*20MM M139 GUN, AUTOMATIC

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR .. (MAJ GS)

GOVERNMENT PERSONNEL  
CHINA LAKE, NAVAL WEAPONS CENTER  
GULICK, LEONARD  
ROMERO, EDUARDO S.

\*25MM PROJECTILES

\*20MM M61 GUN AND DERIVATIVES

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WALLEN, STUVIE C.

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

\*30-30 LEVER ACTION

316

\*40MM AMMUNITION

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS  
SMITH, ROBERT C.

\*30MM AIRCRAFT WEAPON SYSTEM

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LEECH, WILLIAM (DR.)

\*40MM AMMUNITION (GROUND SYSTEMS)

GOVERNMENT PERSONNEL  
FORT BELVOIR, COMBAT DEV. COMMAND, MAT. SYS. DIR.  
SNOPEN, ROBERT G.

\*30MM AMMUNITION

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, AMMUNITION DEV. AND ENG. DIR.  
DECAPRIO, LOUIS  
SMITH, ROBERT C.

\*40MM 80FDRS AMMUNITION

\*30MM AUTOMATIC CANNON

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

\*40MM CHEMICAL FILLED CARTRIDGES

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
NORAUSKY, PATRICK W. (JR.)  
ROCHA, JOHN G.

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL, DEV. AND ENG. DIR.  
SHAFF, LARRY T.

\*30MM GRENADE LAUNCHER

\*40MM COLORED SMOKE MUNITIONS

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHODES, CHARLES J.

GOVERNMENT PERSONNEL  
EDGEWOOD ARSENAL  
MONOHAN, HUGH (JR.)

\*30MM PROJECTILES

\*40MM EFFECTIVENESS STUDIES

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

GOVERNMENT PERSONNEL  
EGLIN AIR FORCE BASE, ARMAMENT DEV. AND TST CNTR  
FLINT, JAMES

\*4.32MM BARREL DEVELOPMENT

\*40MM HAND AND AUTOMATIC WEAPONS SYSTEM

GOVERNMENT PERSONNEL  
ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
WOLFF, RUSSELL

GOVERNMENT PERSONNEL  
PICATINNY ARSENAL, MUCOM  
CHASKES, LEON T.

\*40-MM GRENADE LAUNCHERS (M203, DBCATA, M79)

\*40MM M75/M129 LAUNCH

GOVERNMENT PERSONNEL  
FORT BENNING, ARMY INFANTRY BOARD  
SHANAHAN, C.O.

INDUSTRIAL SOURCES  
AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

\*40MM PROJECTILES

INDUSTRIAL SOURCES

AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

\*40MM RAPID FIRE WEAPONS

INFORMATION HANDLING ACTIVITIES

BATTELLE MEMORIAL INST., DEF. ANALYSIS & TECH. DIV

\*40MM SELF POWERED AUTOMATIC GRENADE LAUNCHERS

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
LORENZEN, THEODORE G.

\*40MM SIGNAL CARTRIDGE

GOVERNMENT PERSONNEL

ABERDEEN PROVING GROUND, SMALL ARMS SYSTEMS AGCY.  
D'ANDREA, JOSEPH A.

\*40MM/105MM AIRCRAFT GUN MOUNTS

INDUSTRIAL SOURCES

AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

\*40MM/105MM AIRCRAFT GUN MUNITION

INDUSTRIAL SOURCES

AVCO CORPORATION, AVCO PRECISION PRODUCTS DIV.

\*45-70 LEVER ACTION RIFLE

INDUSTRIAL SOURCES

THE BELL MORE-JOHNSON TOOL CO.

\*5.56 MM AMMUNITION

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHOADES, CHARLES J.

\*5.56MM AMMUNITION FOR M16A1 RIFLE

GOVERNMENT PERSONNEL

FRANKFORD ARSENAL, MANUFACTURING TECHNOLOGY DIR.  
SHINDLER, CHARLES E.

\*50 CALIBER VEHICLE, HEAVY, FIXED M85 MACHINE GUN

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)

\*7.62 MM AMMUNITION

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
RHOADES, CHARLES J.

\*7.62MM AND 23MM BUSHMASTER

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ROCHA, JOHN G.

\*7.62MM M14 AND T48

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
ROCHA, JOHN G.

\*7.62MM M219 (M73A1) MACHINE GUN, FIXED

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)

\*7.62MM, M60 SERIES MACHINE GUN

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
COHUT, VICTOR J. (MAJ GS)

\*81NCH SP HOWITZER M110E2

GOVERNMENT PERSONNEL

ROCK ISLAND ARSENAL, WECOM, WEAPONS LAB  
VAUGHAN, EDWIN M.

•9MM SUBMACHINE GUN

518

INDUSTRIAL SOURCES  
THE BELLMORE-JOHNSON TOOL CO.

APPENDIX A

THESAURUS OF SMALL ARMS TERMINOLOGY

*A-i*

THESAURUS  
OF  
SMALL ARMS TERMINOLOGY

Compiled By:

Edith Ward  
Systems Consultants Incorporated  
221 West 57th Street  
New York, New York 10019

Under Contract

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# A

- Acceptance tests 1407
  - BT Proof tests
    - RT Ammunition standards
    - RT Ballistic tests
    - RT Weapons tests
- Accuracy test data 1904
  - BT Ballistic test data
  - BT Weapons test data
  - RT Accuracy tests
- Accuracy tests 1402
  - BT Ballistic tests
  - BT Weapons tests
  - RT Accuracy test data
- Action bars 1906
  - BT Breech mechanisms
  - RT Actions (guns)
  - RT Slide assemblies
- Actions (guns)
  - BT Breech mechanisms
  - RT Action bars
- Aerodynamics 2004
  - BT Fluid dynamics
  - NT Magnus effect
  - RT Ballistics
  - RT Exterior ballistics
  - RT Shock waves
- Air cooled machine guns 1906
  - BT Machine guns
- Aircraft ammunition 1901
  - RT Aircraft armaments
  - RT Fragmentation ammunition
- Aircraft armaments 1904
  - UF Helicopter armaments
  - RT Aircraft ammunition
- Air gauges 1402
  - UF Precisionaire gauges
  - BT Test equipment
  - RT Gauges
- Aluminum cartridge cases 1901
  - BT Cartridge cases
- Ammunition 1901
  - UF Munitions
  - Use of a more specific term is recommended; consult the terms listed below
- Aircraft ammunition
  - Antiaircraft ammunition
  - Antipersonnel ammunition
  - Antitank ammunition
  - Armor piercing ammunition
  - Ball ammunition
  - Biological ammunition
  - Cartridges (explosives)
  - Chemical ammunition
  - Fin stabilized ammunition
  - Flechettes
  - Frangible ammunition
  - Fragmentation ammunition
  - Fuzes (ordnance)
  - Grenades
  - High explosive ammunition
  - Incendiary ammunition
  - Munitions industry
  - Projectiles
  - Propellants
  - Pyrotechnics
  - Rocket assisted ammunition
  - Rockets
  - Rotating bands
  - Shaped charges
  - Small arms ammunition
  - Spin stabilized ammunition
  - Tracers (ordnance)
  - Training ammunition
  - Warheads
- Ammunition belt links 1901
  - UF Cartridge links
  - RT Ammunition belts
  - RT Linkages
- Ammunition belt pull
  - USE Belt pull

USE = Use preferred term; UF = Used For; BT = Broader Term; NT = Narrower Term;  
RT = Related Term

Ammunition belts 1901	Antimateriel weapons 1906
UF Belts	NT Antitank weapons
UF Link belts	RT Antimateriel ammunition
RT Ammunition belt links	
RT Automatic guns	Antipersonnel ammunition 1901
RT Belt feed	RT Antipersonnel weapons
RT Gun feed mechanisms	RT Flechettes
	RT Fragmentation ammunition
Ammunition, caseless	RT Grenades
USE Caseless ammunition	RT Small arms ammunition
Ammunition casualties 1901	Antipersonnel weapons 1906
UF Ammunition failure	RT Antipersonnel ammunition
RT Casualty tests	
RT Function tests	
Ammunition container	Antitank ammunition 1901
USE Containerization	BT Antimateriel ammunition
USE Packaging	NT High explosive antitank ammunition
	RT Antitank weapons
Ammunition designations 1901	RT Armor piercing ammunition
NT Caliber	RT Shaped charges
Ammunition failures	Antitank weapons 1906
USE Ammunition casualties	BT Antimateriel weapons
	RT Antitank ammunition
Ammunition packaging	Anvils 1906
USE Packaging	RT Primers
Ammunition, plastic-cased	A P Ammunition
USE Plastic cartridge cases	USE Armor piercing ammunition
Ammunition specifications 0501	API Ammunition
RT Ammunition standards	USE Armor piercing incendiary ammunition
RT Qualitative Materiel Requirements (QMR)	
Ammunition standards 0501	Arc melting 1308
BT Qualitative Materiel Requirements (QMR)	UF Consumable electrode arc melting
RT Acceptance tests	BT Melting
RT Ammunition specifications	
RT Ballistic tests	Area fire weapons 1906
RT Quality assurance	RT Kill probabilities
RT Quality control	RT Point fire weapons
Antiaircraft ammunition 1901	Arming and safety
BT Antimateriel ammunition	USE Safety and arming
RT Fragmentation ammunition	
Antimateriel ammunition 1901	Armor 1904
NT Antiaircraft ammunition	NT Body armor
NT Antitank ammunition	NT Lightweight armor
NT High explosive antitank ammunition	RT Armor piercing ammunition
RT Antimateriel weapons	RT Penetration tests
RT Small arms ammunition	
	Armor piercing ammunition 1901
	UF AP Ammunition
	BT Antitank ammunition
	RT Armor

Numbers following main terms correspond to subject categories in TEST

- Armor piercing ammunition (cont'd)
    - RT Bullets
    - RT Grenades
    - RT High explosive antitank ammunition
    - RT Penetration tests
    - RT Shaped charges
    - RT Small arms ammunition
  - Armor piercing incendiary ammunition 1901
    - UF API Ammunition
      - RT Bullets
      - RT Small arms ammunition
  - Armor piercing incendiary tracer ammunition (APIT) 1901
    - RT Bullets
    - RT Small arms ammunition
  - Autofrettage 1308
    - BT Erosion
      - RT Erosion analysis
      - RT Gun barrels
      - RT Stress analysis
  - Automatic guns 1906
    - UF Automatics
      - BT Guns
        - NT Machine guns
        - NT Rifle submachine guns
        - NT Selfloading guns
        - NT Semiautomatic guns
          - RT Ammunition belts
          - RT Cyclic rate of fire
          - RT Mode of fire
          - RT Rate of fire
          - RT Small arms
  - Automatics
    - USE Automatic guns
    - USE Pistols
    - USE Semiautomatic guns
- B
- Ball ammunition 1901
    - RT Cartridges
    - RT Small arms ammunition
  - Ballistic cameras 1904
  - BT Test equipment
    - RT Ballistic photography
    - RT High speed cameras
  - Ballistic performance
    - USE Ballistics
    - USE Ballistic tests
  - Ballistic photography 1904
    - BT Photography
      - RT Ballistic cameras
      - RT Ballistic tests
      - RT High speed photography
      - RT Stroboscopic photography
  - Ballistic ranges 1402
    - BT Test ranges
      - NT Function and casualty ranges
      - NT Velocity and pressure ranges
      - RT Ballistic tests
  - Ballistics 1904
    - UF Ballistic performance
    - UF Trajectories
      - NT Exterior ballistics
      - NT Free flight ballistics
      - NT Interior ballistics
      - NT Launch ballistics
      - NT Obturation ballistics
      - NT Terminal ballistics
        - RT Aerodynamics
        - RT Ballistic tests
        - RT Shock waves
  - Ballistic test data 1904
    - NT Accuracy test data
    - NT Bullet fit test data
    - NT Bullet pull test data
    - NT Casualty test data
    - NT Extraction test data
    - NT Function test data
    - NT Grenade cartridge test data
    - NT Hangfire test data
    - NT Incendiary flash test data
    - NT Muzzle flash test data
    - NT Penetration test data
    - NT Pressure test data
    - NT Primer sensitivity test data
    - NT Screen perforation test data
    - NT Stripping test data
    - NT Trace test data
    - NT Velocity test data
    - NT Waterproof test data
      - RT Ballistic tests
      - RT Weapons test data

Ballistic test equipment	Base detonating fuzes 1901
USE Test equipment	BT Fuzes
	RT PD Fuzes
Ballistic test facilities	Bayonet lugs
USE Test facilities	USE Bayonet mounts
Ballistic tests 1402	Bayonet mounts 1906
UF Ballistic performance	UF Bayonet lugs
NT Accuracy tests	BT Gun components
NT Bullet fit tests	RT Barrel bands
NT Bullet pull tests	RT Bayonets
NT Casualty tests	
NT Extraction tests	Bayonets 1906
NT Function tests	BT Gun auxiliary equipment
NT Grenade cartridge tests	RT Bayonet mounts
NT Hangfire tests	
NT Incendiary flash tests	Belt feed 1906
NT Muzzle flash tests	BT Gun feed mechanisms
NT Penetration tests	RT Ammunition belts
NT Pressure tests	RT Machine guns
NT Primer sensitivity tests	
NT Screen perforation tests	Belt pull
NT Stripping tests	USE Ammunition belt pull
NT Trace tests	
NT Velocity tests	Belts
NT Waterproof tests	USE Ammunition belts
RT Acceptance tests	
RT Ammunition standards	Benefit cost analysis
RT Ballistic photography	USE Cost benefit analysis
RT Ballistic ranges	
RT Ballistics	Biological ammunition 1901
RT Ballistic test data	RT Chemical ammunition
RT Proof tests	
RT Test equipment	Bipods 1906
RT Test facilities	UF Integral bipods
RT Test weapons	BT Gun auxiliary equipment
RT Weapons tests	BT Weapon mounts
Barrel bands 1906	Black powder 1901
BT Gun components	BT Propellants
RT Bayonet mounts	
RT Gun barrels	Blank cartridges 1901
	BT Cartridges
Barrel group	RT Training ammunition
USE Gun barrels	
Barrel length 1906	Blowback operated guns 1906
RT Caliber	BT Automatic guns
RT Gun barrels	BT Semiautomatic guns
Barrels (guns)	Boattail bullets 1901
USE Gun barrels	BT Bullets
Barrel vibration (whip) 1906	Body armor 1904
UF Gun barrel vibration	BT Armor
RT Gun barrels	

Numbers following main terms correspond to subject categories in TEST

Bolt actions 1906	Bolt raceways 1906
RT Actions (guns)	RT Bolt group
RT Bolt group	
RT Cams	Bolt releases 1906
RT Manually operated guns	RT Bolt group
Bolt assemblies	Bolt sleeves 1906
USE Bolt group	RT Bolt group
Bolt bodies	Bolt stops 1906
USE Bolt cylinders	RT Bolt group
	RT Detents
Bolt cylinders 1906	Bonding
UF Bolt bodies	UF Solid state bonding
RT Bolt group	BT Materials technology
	NT Diffusion bonding
Bolt faces 1906	NT Explosive bonding
RT Bolt group	NT Friction bonding
	NT Gas pressure bonding
Bolt group 1906	RT Joining
UF Bolt assemblies	RT Metals
UF Breech blocks	RT Soldering
UF Breech bolts	RT Welding
BT Breech mechanisms	
BT Gun components	Bore diameter 1906
RT Bolts	RT Bores (guns)
RT Bolt faces	RT Caliber
RT Bolt handles	
RT Bolt head guides	Bores (guns) 1906
RT Bolt knobs	RT Bore diameter
RT Bolt locks	RT Gun barrels
RT Bolt lugs	
RT Bolt raceways	
RT Bolt releases	Borescopes 1402
RT Bolt sleeves	BT Proof test equipment
RT Bolt stops	
RT Cams	Brass cartridge cases 1901
	BT Cartridge cases
Bolt handles 1906	
RT Bolt group	Breech blocks
	USE Bolt group
Bolt head guides 1906	
RT Bolt group	Breech bolts
	USE Bolt group
Bolt knobs 1906	
RT Bolt group	Breechbore gauges
	BT Proof test equipment
Bolt lift tests	RT Gauges
USE Extraction tests	
	Breeches
Bolt locks 1906	USE Breech mechanisms
RT Bolt group	
	Breeching space 1906
Bolt lugs 1906	RT Gun barrels
RT Bolt group	

USE = Use preferred term; UF = Used For; BT = Broader Term; NT = Narrower Term;  
RT = Related Term

- 
- Breech locks 1906
    - RT Breech mechanisms
  - Breech mechanisms 1906
    - UF Breeches (guns)
    - BT Gun components
    - NT Action bars
    - NT Actions (guns)
    - NT Bolt group
    - RT Breech locks
  - Brushes (cleaning)
    - USE Cleaning brushes
  - Buckshot
    - USE Shot
  - Bullet casting 1308
    - BT Bullet fabrication
    - RT Bullets
    - RT Munitions
  - Bullet catchers 1402
    - UF Bullet traps
    - BT Test equipment
  - Bullet cores 1901
    - UF Cores (bullets)
    - RT Bullets
  - Bullet fabrication 1308
    - UF Bullet manufacturing
    - NT Bullet casting
    - NT Bullet sizing
    - NT Bullet swaging
    - RT Bullets
    - RT Munitions industry
  - Bullet fit test data 1904
    - BT Ballistic test data
    - RT Bullet fit tests
  - Bullet fit tests 1402
    - BT Ballistic tests
    - RT Bullet fit test data
  - Bullet jackets 1901
    - RT Bullets
    - RT Full metal jacketed bullets (FMJ)
  - Bullet manufacturing
    - USE Bullet fabrication
  - Bullet pull test data 1904
    - BT Ballistic test data
    - RT Bullet pull tests
  - Bullet pull tests 1402
    - BT Ballistic tests
    - RT Bullet pull test data
  - Bullets 1901
    - Projectile only. For assembly consisting of cartridge case, primer, projectile, and propellant, use Cartridges".
    - BT Projectiles
      - NT Boattail
      - NT Hollow point bullets
      - NT Round nose bullets
      - NT Semi wadcutters
      - NT Soft point bullets
      - NT Spitzer bullets
      - NT Wadcutters
    - RT Armor piercing ammunition
    - RT Armor piercing incendiary ammunition
    - RT Armor piercing incendiary tracer ammunition
    - RT Bullet casting
    - RT Bullet cores
    - RT Bullet fabrication
    - RT Bullet jackets
    - RT Bullet seats
    - RT Bullet sizing
    - RT Bullet swaging
    - RT Cartridges
    - RT Incendiary ammunition
    - RT Munitions industry
    - RT Ogives
    - RT Sabots
    - RT Tracer ammunition
  - Bullet seats 1906
    - RT Bullets
    - RT Gun barrels
  - Bullet sizing 1308
    - BT Bullet fabrication
    - RT Bullets
    - RT Munitions industry
  - Bullet swaging 1308
    - BT Bullet fabrication
    - RT Bullets
    - RT Munitions industry
    - RT Swaging
  - Bullet traps
    - USE Bullet catchers
- 

Numbers following main terms correspond to subject categories in TEST

## C

## Caliber 1901, 1906

All caliber designations, metric or decimal, of weapons or ammunition are valid SATIN identifiers. They are entered as ...cal., ...mm, or cal....

In naval ordnance, ...CAL. denotes the ratio of barrel length to projectile diameter.

BT Ammunition designations

BT Weapon designations

RT Barrel length

RT Bore diameter

RT Rifles

## Calorimeters 1401

BT Test equipment

## Cams 1906

RT Bolt actions

RT Bolt group

## Carbines 1906

BT Rifles

BT Shoulder weapons

## Cartridge case liners

USE Cartridge cases

## Cartridge cases 1901

UF Cartridge case liners

NT Aluminum cartridge cases

NT Brass cartridge cases

NT Plastic cartridge cases

NT Steel cartridge cases

RT Cartridges

RT Primer pockets

## Cartridge ejection velocity 1901

UF Ejection velocity

BT Weapon dynamics

## Cartridge extractors

USE Extractors (ammunition)

## Cartridge links

USE Ammunition belt links

## Cartridge points

RT Cartridges

## Cartridges 1901

Assembly consisting of cartridge case, primer, projectile and propellant. "Bullets" refers to projectile only.

UF Shells

NT Blank cartridges

NT Dummy cartridges

NT NATO cartridges

RT Ball ammunition

RT Bullets

RT Cartridge cases

RT Cartridge points

RT Munitions industry

RT Primers

RT Shot

RT Small arms ammunition

## Casting 1308

UF Molding

RT Melting

## Casualty test data 1904

BT Ballistic test data

RT Casualty tests

RT Function test data

## Casualty tests 1402

BT Ballistic tests

RT Ammunition casualties

RT Casualty test data

RT Function and casualty ranges

RT Function tests

RT Misfires

## Ceramics 1106

RT Materials technology

## Chemical ammunition 1901

NT Poison gas ammunition

NT Tear gases

RT Biological ammunition

RT Dissemination technology

RT Grenades

RT Incapacitating agents

RT Pyrotechnics

RT Riot control cartridges

## Chemical erosion 1113

BT Erosion

## Chronographs

USE Chronometers

## Chronometers 1402

UF Chronographs

UF Interval counters

- 
- Cleaning 1308
    - RT Cleaning agents
    - RT Cleaning equipment
  - Cleaning agents 1111
    - NT Degreasers
    - NT Solvents
    - RT Cleaning
    - RT Cleaning equipment
  - Cleaning brushes 1309
    - UF Brushes (cleaning)
    - BT Cleaning equipment
  - Cleaning equipment 1309
    - NT Cleaning brushes
    - NT Cleaning rods
    - RT Cleaning
    - RT Cleaning agents
    - RT Gun auxiliary equipment
  - Cleaning rods 1309
    - UF Rods (cleaning)
    - BT Cleaning equipment
  - Coating processes 1308
    - UF Inorganic coating
    - BT Materials technology
    - NT Deposition
    - NT Electrodeposition
    - NT Electroplating
    - NT Galvanizing
    - NT Spray coating
    - NT Vapor deposition
    - RT Coatings
    - RT Coextrusion
    - RT Metals
  - Coatings 1103
    - RT Coating processes
    - RT Deposition
    - RT Electrodeposition
    - RT Electroplating
    - RT Galvanizing
    - RT Materials technology
    - RT Optical coatings
    - RT Vapor deposition
  - Coextrusion 1308
    - BT Materials technology
    - RT Coating processes
    - RT Metals
  - Collimating lenses 1402
    - RT Gun sight assemblies
    - RT Optical gun sights
    - RT Reflex "limator" gun sights
  - Color radiography 1402
  - Component standardization 1505
    - RT Standardization
  - Composite barrels 1906
    - BT Gun barrels
    - RT Composite materials
  - Composite materials 1104
    - NT Metal alloys
    - RT Ceramics
    - RT Composite barrels
    - RT Materials technology
    - RT Metals
  - Computers 0702
  - Computer simulation 1402
    - UF Simulation (computers)
    - BT Mathematical models
  - Computers, fire control
    - USE Fire control computers
  - Computing gun sights 1905
    - BT Gun auxiliary equipment
    - BT Gun sights
    - NT Gun directors
    - NT Gyroscopic gun sights
  - Consumable electrode arc melting
    - USE Arc melting
  - Containerization 1304 1505
    - UF Ammunition containers
    - RT Packaging
  - Cooling 2013
  - Cores (bullets)
    - USE Bullet cores
  - Corrosion 1113
    - NT Galvanic corrosion
    - NT Oxidation
    - RT Corrosion analysis
    - RT Corrosion inhibitors
    - RT Erosion
  - Corrosion analysis 1308
    - BT Materials technology
    - RT Corrosion
    - RT Pressure stress analysis
    - RT Stress analysis
    - RT Thermal stress analysis
- 

Numbers following main terms correspond to subject categories in TEST



Corrosion inhibitors 1107  
UF Corrosion preventives

Corrosion preventives  
USE Corrosion inhibitors

Cost benefit analysis 0501  
UF Benefit cost analysis  
RT Cost effectiveness  
RT Life cycle costs

Cost effectiveness 1401  
NT Life cycle costs  
RT Cost benefit analysis

Crack propagation 1113 2012  
RT Fatigue (materials)  
RT Fracture mechanics  
RT Materials technology

Cranes (guns)  
USE Yokes

Cyclic rate of fire  
BT Weapon dynamics  
RT Automatic guns  
RT Rate of fire

Cylinder feed 1906  
BT Gun feed mechanisms  
RT Gun cylinders  
RT Revolvers

Cylindrical bodies  
NT Gun components  
RT Projectiles

RT Coatings  
RT Materials technology

Depot maintenance  
USE Shop maintenance

Detents 1906  
RT Bolt stops

Detonators 1901  
RT Explosives  
RT Explosive trains  
RT Fuzes  
RT Primers

Diagnostic systems 0902  
RT TMDE (Test, measurement,  
and diagnostic equipment)

Diffusion bonding 1308  
UF Diffusion welding

Diffusion welding  
USE Diffusion bonding

Dispersion  
USE Projectile dispersion

Dissemination technology 0704  
RT Chemical ammunition  
RT Decontamination  
RT Grenades

Dummy cartridges 1901  
BT Cartridges  
RT Training ammunition

Dynamic analysis 1407

## D

Darts  
USE Flechettes

Decontamination 1407  
RT Dissemination technology  
RT Pollution abatement

Degreasers 1111  
BT Cleaning agents

Deposition 1308  
BT Coating processes

## E

Ejection velocity  
USE Cartridge ejection velocity

Elasticity  
USE Elastic properties

Elastic limits  
USE Elastic properties

USE = Use preferred term; UF = Used For; BT = Broader Term; NT = Narrower Term;  
RT = Related Term

Elastic limits (cont'd)	Erosion 1113
RT Kinematics	NT Autofrettage
RT Materials technology	NT Chemical erosion
	NT Friction wear
Elastoplastic analysis 1402	NT Gas cutting
BT Pressure stress analysis	RT Corrosion
RT Stress analysis	RT Erosion analysis
	RT Friction
Electric fuzes	Erosion analysis 1402
BT Fuzes	BT Materials technology
RT PD fuzes	RT Autofrettage
RT Proximity fuzes	RT Erosion
RT VT fuzes	RT Stress analysis
Electrodeposition 1103	Experimental design 0501
BT Coating processes	
RT Coatings	Explosive bonding 1308
	UF Explosive welding
Electromagnetic testing 1402	BT Bonding
	RT Explosive forming
Electron beam melting 1308	Explosive forming 1308
BT Melting	RT Explosive bonding
	RT Shaped charges
Electronic photography 1405	Explosive welding
BT High speed photography	USE Explosive bonding
RT Photography	
Electron microscopes 1402	Explosives 1901
	UF Powder charges
Electrooptics 2003 2006	RT Detonators
NT Lasers	RT Explosive trains
Electroplating 1308	RT Propellants
BT Coating processes	RT Pyrotechnics
RT Coatings	RT Safety and arming
Electrostatic hangfire recorders 1402	Explosive trains 1901
RT Hangfire tests	UF Fuze explosive trains
	RT Detonators
Elevation scale 1906	RT Explosives
RT Gun sight assemblies	RT Primers
Engineering change proposals (ECP)	Exterior ballistics 1904
0501	UF External ballistics
	UF Transition ballistics
Engineering design tests 1406	BT Ballistics
	NT Free flight ballistics
Engineering release records (ERR)	RT Aerodynamics
0501	RT Chronometers

Numbers following main terms correspond to subject categories in TEST

Exterior ballistics (cont'd)  
 RT Fluid dynamics  
 RT Interior ballistics  
 RT Magnus effect

External ballistics  
 USE Exterior ballistics

Extraction tests 1402  
 UF Bolt lift tests  
 BT Ballistic tests  
 RT Extraction test data  
 RT Extractors (ammunition)

Extractor rods 1906  
 RT Extractors (ammunition)

Extractors (ammunition) 1906  
 UF Cartridge extractors  
 RT Extraction tests  
 RT Extractor rods

## F

Fatigue (materials) 1113 2012  
 RT Crack propagation  
 RT Fracture properties

Federal supply classification (FSC)  
 0501

Field maintenance 1505  
 BT Logistics management  
 RT Maintainability  
 RT Shop maintenance

Fin stabilized ammunition 1901  
 NT Flechettes

Fire control components 1905  
 BT Fire control systems  
 NT Gun directors

Fire control computers 1905  
 UF Computers (fire control)  
 RT Fire control systems  
 RT Gun directors

Fire control systems 1905  
 NT Fire control components  
 RT Fire control computers

Firing mechanisms 1901  
 RT Fuzes  
 RT Weapon firing mechanisms

Firing pins 1906  
 RT Strikers (guns)  
 RT Weapon firing mechanisms

Flares 1901  
 BT Pyrotechnics  
 RT Spotting charges

Flash holes 1901  
 RT Primer pockets

Flechettes 1901  
 UF Darts  
 BT Fin stabilized ammunition  
 BT Projectiles  
 RT Antipersonnel ammunition  
 RT Armor piercing ammunition  
 RT Multiple flechettes  
 RT Sabots  
 RT Spin stabilized ammunition

Fluid dynamics 2004  
 NT Aerodynamics  
 RT Exterior ballistics  
 RT Magnus effect

Fluorosilicones 0702  
 UF Silicone fluorides

Forcing cones 1906  
 UF Leads  
 RT Gun barrels  
 RT Shotguns

Foreign small arms 1906  
 UF Small arms (foreign)

- Fracture mechanics
  - USE Fracture properties
- Fracture properties 2012
  - UF Fracture mechanics
    - RT Crack propagation
    - RT Fatigue (materials)
- Fragmentation ammunition 1901
  - RT Aircraft ammunition
  - RT Antiaircraft ammunition
  - RT Antipersonnel ammunition
  - RT Armor piercing ammunition
  - RT Grenades
  - RT Projectiles
- Frangible ammunition 1901
  - BT Training ammunition
- Free flight ballistics 1904
  - BT Ballistics
  - BT Exterior ballistics
- Friction 1407
  - RT Erosion
  - RT Friction wear
  - RT Lubrication
- Friction bonding 1308
  - UF Friction welding
  - BT Bonding
- Friction wear 113
  - BT Erosion
  - RT Friction
- Friction welding
  - USE Friction bonding
- Full metal jacketed bullets (FMJ) 1901
  - BT Bullets
  - RT Bullet jackets
- Function and casualty ranges 1402
  - BT Ballistic ranges
  - RT Casualty tests
  - RT Function tests
- Function test data 1904
  - BT Ballistic test data
  - RT Casualty test data
  - RT Function tests
- Function tests 1402
  - BT Ballistic tests
  - RT Ammunition casualties
  - RT Casualty tests
  - RT Function and casualty ranges
  - RT Function test data
  - RT Misfires
- Fuses (ordnance)
  - USE Fuzes
- Fuze explosive trains
  - USE Explosive trains
- Fuzes 1901
  - UF Fuses (ordnance)
    - NT Base detonating fuzes
    - NT Electric fuzes
    - NT Grenade fuzes
    - NT PD fuzes
    - NT Proximity fuzes
    - NT Time fuzes
    - NT VT fuzes
  - RT Detonators
  - RT Firing mechanisms
  - RT Fuze setters
  - RT Primers
  - RT Safety and arming
- Fuze setters 1901
  - RT Fuzes
  - RT Time fuzes
- Galvanic corrosion 1113
  - BT Corrosion
- Galvanizing 1308
  - BT Coating processes
  - RT Coatings

## G

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Numbers following main terms correspond to subject categories in TEST

- Gas chromatography 0704
  - BT Materials technology
  - BT Nondestructive testing
  - RT Infrared spectroscopy
- Gas cutting 1113 1308
  - BT Erosion
  - BT Metal cutting
- Gas cylinders (ordnance) 1906
  - RT Gas operated guns
- Gas dynamics 2004
  - BT Weapon dyanmics
  - RT Gas operated guns
  - RT Propellants
  - RT Recoilless guns
  - RT Recoilless rifles
- Gas operated guns 1906
  - BT Automatic guns
  - BT Semiautomatic guns
  - RT Gas cylinders (ordnance)
  - RT Gas dynamics
  - RT Propellants
- Gas pressure bonding 1308
  - UF Gas pressure welding
  - UF Pressure gas bonding
- Gas pressure welding
  - USE Gas pressure bonding
- Gatling mechanisms 1906
  - BT Machine guns
  - RT Gun barrels
  - RT Gun feed mechanisms
  - RT Rapid fire weapons
- Gauges 1402
  - BT Test equipment
  - RT Air gauges
  - RT Breechbore gauges
  - RT Headspace gauges
  - RT Piezoelectric gauges
  - RT Pressure gauges
  - RT Strain gauges
  - RT Star gauges
- Graded lethality weapons 1909
  - RT Kill probabilities
  - RT Lethality
  - RT Nonlethal weapons
  - RT Riot control weapons
- Grenade cartridge test data 1904
  - BT Ballistic test data
  - RT Grenade cartridge tests
- Grenade cartridge tests 1402
  - BT Ballistic tests
  - RT Grenade cartridge test data
- Grenade fuzes 1901
  - BT Fuzes
  - RT Grenades
- Grenade launchers 1906
  - BT Small arms
  - RT Grenades
- Grenades 1901
  - BT Projectiles
  - RT Antipersonnel ammunition
  - RT Armor piercing ammunition
  - RT Chemical ammunition
  - RT Dissemination technology
  - RT Fragmentation ammunition
  - RT Grenade fuzes
  - RT Grenade launchers
  - RT High explosive ammunition
  - RT Incendiary gels
  - RT Small arms ammunition
- Grips 1906
  - NT Pistol grips
  - RT Gun stocks
- Grooves (rifling) 1906
  - RT Lands (rifling)
  - RT Rifling (guns)
- Gun accessories
  - USE Gun auxiliary equipment

## Gun auxiliary equipment 1906

UF Gun accessories

UF Small arms accessories

NT Bayonets

NT Bipods

NT Computing gun sights

NT Gun sights

NT Gun slings

NT Gyroscopic gun sights

NT Iron gun sights

NT Muzzle devices

NT Open gun sights

NT Optical gun sights

NT Weapon mounts

RT Cleaning equipment

RT Gun components

RT Lubricants

RT Recoil mechanisms

RT Silencers

## Gun barrel attachments 1906

BT Gun components

RT Gun barrels

## Gun barrel materials 1100

RT Composite materials

RT Gun barrels

## Gun barrels 1906

UF Barrel group

UF Barrels (guns)

UF Gun tubes

BT Gun components

RT Autofrettage

RT Barrel bands

RT Barrel length

RT Barrel vibration (whip)

RT Breeching space

RT Bullet seats

RT Forcing cones

RT Gatling mechanisms

RT Gun barrel attachments

RT Gun barrel materials

RT Gun bores

RT Gun chambers

RT Gun muzzles

RT Headspace

RT Rifling (guns)

## Gun barrel vibration

USE Barrel vibration (whip)

## Gun chambers 1906

RT Gun barrels

## Gun components 1906

NT Barrel bands

NT Bayonet mounts

NT Bolt group

NT Breech mechanisms

NT Gun barrel attachments

NT Gun barrels

NT Gun cylinders

NT Gun feed assemblies

NT Gun sight assemblies

NT Gun stocks

NT Magazine assemblies

NT Receivers (guns)

NT Slide assemblies

NT Trigger group

NT Weapon firing mechanisms

RT Gun auxiliary equipment

## Gun cylinders 1906

BT Cylindrical bodies

BT Gun components

RT Cylinder feed

RT Revolvers

## Gun directors 1905

BT Computing gun sights

BT Fire control components

RT Fire control computers

## Gun feed assemblies 1906

BT Gun components

RT Gun feed mechanisms

RT Magazine assemblies

## Gun feed mechanisms 1906

NT Belt feed

NT Clip feed

NT Cylinder feed

NT Magazine feed

RT Ammunition belts

RT Gatling mechanisms

RT Gun feed assemblies

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Numbers following main terms correspond to subject categories in TEST

Gun firing mechanisms  
USE Weapon firing mechanisms

Gun muzzles 1906  
RT Gun barrels  
RT Muzzle brakes  
RT Muzzle devices  
RT Muzzle velocity

Gunpowder  
USE Propellants

Gun propellants  
USE Propellants

Guns (ordnance) 1906  
NT Automatic guns  
NT Machine guns  
NT Pistols  
NT Revolvers  
NT Rifles  
NT Manually operated guns  
NT Semiautomatic guns  
NT Shot guns  
NT Small arms

Gun sight assemblies 1906  
UF Sight assemblies  
BT Gun components  
RT Collimating lenses  
RT Elevation scale  
RT Gun sights  
RT Reticles  
RT Windage scale

Gun sights 1906  
UF Sights  
BT Gun auxiliary equipment  
NT Computing gun sights  
NT Gyroscopic gun sights  
NT Iron gun sights  
NT Open gun sights  
NT Optical gun sights  
RT Gun sight assemblies

Gun slings 1906  
BT Gun auxiliary equipment

Gun stocks 1906  
UF Stock  
BT Gun components  
RT Grips  
RT Pistol grips

Gun tubes  
USE Gun barrels

Gyroscopic gun sights 1905  
BT Computing gun sights  
BT Gun auxiliary equipment  
BT Gun sights

## H

Hammers (guns) 1906  
RT Strikers (guns)  
RT Weapon firing mechanisms

Hand guns  
USE Hand weapons

Hand weapons 1906  
UF Hand guns  
BT Small arms  
NT Pistols  
NT Revolvers

Hangfire test data 1904  
BT Ballistic test data  
RT Hangfire tests

Hangfire tests 1402  
BT Ballistic tests  
RT Electrostatic hangfire recorders  
RT Hangfire test data  
RT Misfires

Headspace 1906  
RT Gun barrels  
RT Headspace gauges

Headspace gauges 1402	High speed cameras 1405
BT Test equipment	BT Test equipment
RT Gauges	RT Ballistic cameras
RT Headspace	RT High speed photography
HE Ammunition	High speed photography 1405
USE High explosive ammunition	BT Photography
Heat ammunition	NT Electronic photography
USE High explosive antitank	NT Stroboscopic photography
ammunition	RT Ballistic photography
Heat transfer 2013	RT High speed cameras
Heat treatment 1308	RT Weapon dynamics
HEI ammunition	High speed weapons
USE High explosive incendiary	USE High velocity weapons
ammunition	High velocity guns
Helicopter armaments	USE High velocity weapons
USE Aircraft armaments	High velocity weapons 1906
High explosive ammunition 1901	UF High speed weapons
UF HE ammunition	UF High velocity guns
RT Grenades	Hollow point bullets
RT High explosive incendiary	BT Bullets
ammunition	Holography 1405
RT Small arms ammunition	RT Lasers
High explosive antitank ammunition 1901	RT Photography
UF Heat ammunition	Human factors engineering 0505
BT Antimateriel ammunition	UF Man weapon interaction
BT Antitank ammunition	RT Man machine systems
RT Armor piercing ammunition	Hydraulic extrusion 1302
RT Small arms ammunition	
High explosive incendiary ammunition	
1901	
UF HEI ammunition	
RT High explosive ammunition	
RT Incendiary ammunition	
RT Small arms ammunition	
High fragmentation steel 1106	
High rate loading effects 2011	Impact effects 2011

Numbers following main terms correspond to subject categories in TEST



- Incapacitating agents 1502
    - NT Tear gases
    - RT Chemical ammunition
    - RT Incapacitation
    - RT Tear gas projectors
  - Incapacitation 1502
    - RT Incapacitating agents
    - RT Nonlethal weapons
  - Incendiary ammunition
    - RT Bullets
    - RT High explosive incendiary ammunition
    - RT Grenades
    - RT Incendiary gels
    - RT Pyrotechnics
    - RT Small arms ammunition
  - Incendiary flash test data 1904
    - BT Ballistic test data
    - RT Incendiary flash tests
  - Incendiary flash tests 1402
    - BT Ballistic tests
    - RT Incendiary flash test data
  - Incendiary gels 1502
    - UF Incendiary mixtures
    - RT Grenades
    - RT Incendiary ammunition
  - Incendiary mixtures
    - USE Incendiary gels
  - Induction melting 1308
    - BT Melting
  - Inert electrode arc melting
  - Infantry 1503
    - RT Infantry training
    - RT Infantry weapons
    - RT Materiel needs (MN)
  - Infantry training 0509
    - RT Infantry
    - RT Targets (ordnance)
    - RT Training ammunition
  - Infantry weapons 1906
    - RT Infantry
    - RT Logistics management
    - RT Materiel needs (MN)
    - RT Personal defense weapons
    - RT Small arms
    - RT Survival weapons
  - Infrared spectroscopy 1402
    - BT Materials technology
    - BT Nondestructive testing
    - RT Gas chromatography
  - Inorganic coating
    - USE Coating processes
  - Integral bipods
    - USE Bipods
  - Interior ballistics 1904
    - BT Ballistics
    - NT Obturation ballistics
    - RT Chronometers
    - RT Exterior ballistics
  - Interval counters
    - USE Chronometers
  - Iron gun sights 1905
    - BT Gun auxiliary equipment
    - BT Gun sights
- J
- Joining 1308
    - BT Materials technology
    - NT Soldering
    - NT Welding
    - RT Bonding
    - RT Metals

USE = Use preferred term; UF = Used For; BT = Broader Term; NT = Narrower Term;  
RT = Related Term

## K

Kill probabilities 1904  
UF Probability of kill  
RT Area fire weapons  
RT Graded lethality weapons  
RT Lethality  
RT Point fire weapons

Kinematic analysis  
USE Kinematics

Kinematics 2012  
UF Kinematic analysis  
NT Vibration research  
RT Elastic properties  
RT Materials technology  
RT Resonance  
RT Weapon dynamics

## L

Lands (rifling) 1906  
RT Rifling (guns)

Lasers 2005  
BT Electrooptics  
RT Holography

Launch ballistics 1904  
BT Ballistics  
RT Muzzle velocity

Leads  
USE Forcing cones

Legislation 0504

Lethality 1904  
RT Graded lethality weapons  
RT Kill probabilities  
RT Lethality testing  
RT Nonlethal weapons

Lethality testing 1402  
RT Lethality

Life cycle costs 1401  
BT Cost effectiveness  
RT Cost benefit analysis  
RT Maintainability  
RT Reliability

Lightweight armor 1904  
BT Armor

Linkages 1901  
RT Ammunition belt links

Link belts  
USE Ammunition belts

Liquid propellant guns 1906  
RT Liquid propellants  
RT Propellants

Liquid propellants 1701  
BT Propellants  
RT Liquid propellant guns  
RT Solid propellants

Logistics management 1505  
NT Field maintenance  
NT Shop maintenance  
RT Infantry weapons  
RT Maintainability  
RT Materiel needs (MN)  
RT Reliability

Lubricants 1108  
RT Gun auxiliary equipment  
RT Lubrication

Lubrication  
RT Friction  
RT Lubricants

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Numbers following main terms correspond to subject categories in TEST

## M

- M 1906  
 All M(model) numbers are valid SATIN descriptors. They are entered as M., followed, where appropriate, by weapon name, caliber in mm or decimals of an inch, and any other term(s) required to identify the weapon, e. g. M60D machine gun 7.62mm NATO.  
 UF Model  
   BT Weapon designations  
   RT MK
- Machine gun production 1906  
   RT Machine guns
- Machine guns 1906  
   BT Automatic guns  
   BT Guns (ordnance)  
   BT Rapid fire weapons  
   NT Air cooled machine guns  
   NT Gatling mechanisms  
   NT Water cooled machine guns  
   RT Belt feed  
   RT Machine gun production  
   RT Rifle submachine guns  
   RT Small arms  
   RT Submachine guns
- Mach waves  
   USE Shock waves
- Magazine assemblies 1901  
   BT Gun components  
   RT Magazine feed  
   RT Magazines (ammunition)
- Magazine feed 1906  
   BT Gun feed mechanisms
- RT Magazine assemblies  
   RT Magazines (ammunition)
- Magazines (ammunition) 1901  
   RT Magazine assemblies  
   RT Magazine feed  
   RT Small arms ammunition
- Magnus effect 2004  
   BT Aerodynamics  
   RT Exterior ballistics  
   RT Fluid dynamics
- Maintainability 1407  
   RT Field maintenance  
   RT Life cycle costs  
   RT Logistics management  
   RT Reliability  
   RT Shop maintenance
- Man machine systems 0505  
   UF Man weapon interaction  
   RT Human factors engineering
- Manually operated guns  
   BT Guns (ordnance)  
   RT Bolt actions
- Man weapon interaction  
   USE Human factors engineering  
   USE Man machine systems
- Mark  
   USE MK
- Mass spring accelerators 1309
- Materials development  
   USE Materials technology
- Materials research  
   USE Materials technology
- Materials technology 1100  
   UF Materials development  
   UF Materials research  
   NT Bonding  
   NT Coating processes  
   NT Coextrusion

- Materials technology (cont'd)
- NT Corrosion analysis
  - NT Erosion analysis
  - NT Gas chromatography
  - NT Infrared spectroscopy
  - NT Joining
  - NT Melting
  - NT Metal cutting
  - NT Metallurgy
  - NT Swaging
  - NT Special applications materials
  - NT Strain rate effects
  - NT Stress analysis
  - NT Temperature effects
    - RT Ceramics
    - RT Coatings
    - RT Composite materials
    - RT Crack propagation
    - RT Deposition
    - RT Elastic properties
    - RT Kinematics
    - RT Metal alloys
    - RT Nondestructive testing
    - RT Plastic properties
    - RT Plastics
    - RT Powder metallurgy
    - RT Radioactive isotopes
    - RT Rubber compositions (natural)
    - RT Rubber compositions (synthetic)
- Materiel needs (MN) 0501
- RT Infantry
  - RT Infantry weapons
  - RT Logistics management
- Mathematical models 0201
- NT Computer simulation
  - RT Physical simulation
- Mechanical testing
- USE Mechanical tests
- Mechanical tests 1402
- UF Mechanical testing
- Melting 1308
- BT Materials technology
  - NT Arc melting
  - NT Electron beam melting
  - NT Induction melting
  - NT Casting
- Metal alloys 1106
- BT Composite materials
  - RT Materials technology
  - RT Metallurgy
  - RT Metals
- Metal cutting 1308
- BT Materials technology
  - NT Gas cutting
  - RT Metals
- Metallurgical tests 1402
- RT Metallurgy
  - RT Metals
- Metallurgy 1402
- BT Materials technology
  - RT Metal alloys
  - RT Metallurgical tests
  - RT Metals
  - RT Powder metallurgy
- Metals 1106
- RT Bonding
  - RT Coating processes
  - RT Coextrusion
  - RT Composite materials
  - RT Joining
  - RT Metal alloys
  - RT Metal cutting
  - RT Metallurgical tests
  - RT Metallurgy
  - RT Soldering
  - RT Swaging
  - RT Welding
- MFR
- USE Multiple flechettes
- Misfires 1904
- RT Casualty tests
  - RT Function tests
  - RT Hangfire tests
- MK 1906
- All MK (Mark) numbers are valid SATIN descriptors. They are all entered as MK..., followed, where appropriate, by model number, weapon name, caliber in mm or decimals of an inch, and any other term(s) required to identify the weapon,

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Numbers following main terms correspond to subject categories in TEST

- MK (cont'd)  
   e. g. MK 19 Mod. 0 machine gun 40mm  
 UF Mark  
   BT Weapon designations  
   RT M
- Model  
 USE M
- Mode of Fire 1906  
   BT Weapon dynamics  
   RT Automatic guns  
   RT Semiautomatic guns
- Modulated energy devices 0905
- Molding  
 USE Casting
- Multiple flechette rounds (MFR)  
 USE Multiple flechettes
- Multiple flechettes 1901  
 UF MFR  
 UF Multiple flechette rounds (MFR)  
 RT Flechettes
- Munitions  
 USE Ammunition
- Munitions industry 1901  
   RT Bullet casting  
   RT Bullet fabrication  
   RT Bullets  
   RT Bullet sizing  
   RT Bullet swaging  
   RT Cartridges  
   RT Product improvement  
   RT Small arms  
   RT Weapon fabrication
- Muzzle brakes 1906  
   BT Muzzle devices  
   RT Gun muzzles
- Muzzle devices 1906  
   BT Gun auxiliary equipment  
   NT Muzzle brakes  
   NT Muzzle flash suppressors  
   RT Gun muzzles
- Muzzle flash 1901  
   RT Muzzle flash suppressors  
   RT Muzzle flash tests
- Muzzle flash suppressors 1906  
   BT Muzzle devices  
   RT Muzzle flash
- Muzzle flash tests 1402  
   BT Ballistic tests  
   RT Muzzle flash
- Muzzle velocity 1906  
   BT Weapon dynamics  
   RT Gun muzzles  
   RT Launch ballistics
- N
- NATO Cartridges 1901  
   BT Cartridges
- Nondestructive testing 1402  
   NT Gas chromatography  
   NT Infrared spectroscopy  
   NT Ultrasonic imaging  
   NT Xeroradiography  
   NT X ray diffraction  
   NT X ray radiography  
   RT Materials technology  
   RT Radioactive isotopes
- Nonlethal weapons 1909  
   NT Riot batons  
   NT Shock batons  
   NT Tear gas projectors  
   RT Graded lethality weapons  
   RT Grenades  
   RT Incapacitation  
   RT Lethality  
   RT Police weapons  
   RT Riot control weapons

## O

Obturation ballistics 1904  
BT Ballistics  
BT Interior ballistics

Ogives  
RT Bullets

Open gun sights 1906  
BT Gun auxiliary equipment  
BT Gun sights

Operational capability objectives  
(OCO) 0501

Optical coatings 1103 2006  
RT Coatings

Optical gun sights 1905  
UF Optical sights  
BT Gun auxiliary equipment  
BT Gun sights  
NT Reflex collimator gun sights  
NT Reflex gun sights  
RT Collimating lenses  
RT Reticles

Optical sights  
USL Optical gun sights

Oxidation 1113  
BT Corrosion

## P

Packaging 1304  
UF Ammunition containers  
UF Packaging engineering  
UF Packing (packaging)  
RT Containerization

Packaging engineering  
USE Packaging

Packing (packaging)  
USE Packaging

PAD propellants 1901  
BT Propellants

PD fuzes 1901  
UF Point detonating fuzes  
BT Fuzes  
RT Base detonating fuzes  
RT Electric fuzes  
RT Proximity fuzes  
RT VT fuzes

Penetration test data 1904  
BT Ballistic test data  
RT Penetration tests

Penetration tests 1402  
BT Ballistic tests  
RT Armor  
RT Armor piercing ammunition  
RT Penetration test data  
RT Terminal ballistics

Personal defense weapons 1906  
BT Small arms  
RT Infantry weapons

Photography 1405  
NT Ballistic photography  
NT High speed photography  
RT Electronic photography  
RT Holography  
RT Stroboscopic photography

Physical simulation 1407  
UF Simulation, physical  
RT Mathematical models

Piezoelectric gauges 1402  
RT Gauges  
RT Pressure gauges  
RT Strain gauges

Pistol grips 1906  
BT Grips  
RT Gun stocks  
RT Pistols

Numbers following main terms correspond to subject categories in TEST

- Pistols 1906
  - UF Automatics
  - BT Guns (ordnance)
  - BT Hand weapons
  - BT Small arms
    - RT Pistol grips
    - RT Survival weapons
- Plasma spraying 1308
  - BT Spray coating
- Plastic cartridge cases 1901
  - UF Ammunition, plastic cased
  - UF Plastic cased ammunition
  - BT Cartridge cases
  - RT Plastics
- Plastic cased ammunition
  - USE Plastic cartridge cases
- Plasticity
  - USE Plastic properties
- Plastic properties 2012
  - UF Plasticity
  - RT Materials technology
- Plastics 1106
  - RT Materials technology
  - RT Plastic cartridge cases
- Point detonating fuzes
  - USE PD fuzes
- Point fire weapons 1906
  - NT Sniper rifles
  - RT Area fire weapons
  - RT Kill probabilities
- Poison gas ammunition 1901
  - BT Chemical ammunition
- Police guns
  - USE Police weapons
- Police shotguns
  - USE Police weapons
- Police weapons 1906
  - UF Police guns
  - UF Police shotguns
    - RT Nonlethal weapons
    - RT Riot control weapons
- Pollution abatement 1407
  - RT Decontamination
- Powder charges
  - USE Explosives
  - USE Propellants
- Powder determinators 1402
  - BT Test equipment
- Powder metallurgy 1402
  - RT Materials technology
  - RT Metallurgy
  - RT Metals
- Precisionaire gauges
  - USE Air gauges
- Preservation
  - USE Preserving
- Preserving 1308
  - UF Preservation
- Pressure gas bonding
  - USE Gas pressure bonding
- Pressure gauges 1402
  - BT Test equipment
  - RT Gauges
  - RT Piezoelectric gauges
  - RT Pressure tests
- Pressure stress analysis 1402
  - UF Strain rate effects
  - BT Stress analysis
    - NT Elastoplastic analysis
    - RT Corrosion analysis
    - RT Strain rate effects
    - RT Thermal stress analysis

USE = Use preferred term; UF = Used For; BT = Broader Term; NT = Narrower Term;  
RT = Related Term

- Pressure test data 1904
  - BT Ballistic test data
  - RT Pressure tests
- Pressure tests 1402
  - BT Ballistic tests
  - RT Pressure gauges
  - RT Pressure test data
  - RT Velocity and pressure ranges
- Primer drop test calibration cases 1402
  - RT Primer drop test machines
  - RT Primer sensitivity tests
- Primer drop test machines 1402
  - BT Test equipment
  - RT Primer drop test calibration cases
  - RT Primer sensitivity tests
- Primer pellets 1901
  - RT Primers
- Primer pockets 1901
  - RT Cartridge cases
  - RT Flash holes
  - RT Primers
- Primers
  - RT Cartridges
  - RT Detonators
  - RT Explosive trains
  - RT Fuzes
  - RT Primer pellets
  - RT Primer pockets
  - RT Primer sensitivity tests
- Primer sensitivity rooms 1402
  - BT Test facilities
  - RT Primer sensitivity tests
- Primer sensitivity test data 1901
  - BT Ballistic test data
  - RT Primer sensitivity tests
- Primer sensitivity tests 1402
  - BT Ballistic tests
  - RT Primer drop test calibration cases
- RT Primer drop test machines
- RT Primers
- RT Primer sensitivity rooms
- RT Primer sensitivity test data
- Probability of kill
  - USE Kill probabilities
- Product improvement 1401
  - RT Bullet fabrication
  - RT Munitions industry
  - RT Qualitative materiel requirements (QMR)
  - RT Weapon fabrication
- Projectile dispersion 1901
  - UF Dispersion
  - BT Weapon dynamics
- Projectiles 1901
  - NT Bullets
  - NT Flechettes
  - NT Grenades
  - NT Rocket assisted ammunition
  - NT Rockets
  - NT Shot
    - RT Cylindrical bodies
    - RT Fragmentation ammunition
    - RT Projectile weight
    - RT Small arms
- Projectile weight 1901
  - RT Projectiles
- Proof test equipment 1402
  - USE Test equipment
- Proof test facilities 1402
  - USE Test facilities
- Proof tests 1402
  - Used as administrative term. For technical aspects, use ballistic tests or weapons tests.
  - NT Acceptance tests
  - RT Ammunition standards
  - Ballistic tests
  - RT Test equipment
  - RT Test facilities
  - RT Weapons tests

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Numbers following main terms correspond to subject categories in TEST



Propellant burning rate 2019  
RT Propellants

Propellant chemistry 1901  
RT Propellants

Propellant grains 1901  
RT Propellant powders  
RT Solid propellants

Propellant powders 1901  
BT Propellants  
RT Propellant grains  
RT Solid propellants

Propellants 1901  
UF Gun powder  
UF Gun propellants  
UF Powder charges  
NT Liquid propellants  
NT PAD propellants  
NT Propellant powders  
NT Solid propellants  
RT Explosives  
RT Gas operated guns  
RT Liquid propellant guns  
RT Propellant burning rate  
RT Propellant chemistry  
RT Propellant sensitivity  
RT Pyrophoric materials

Propellant sensitivity 2109  
RT Propellants

Proving grounds 1402  
RT Test facilities  
RT Test ranges

Proximity fuzes 1901  
BT Fuzes  
RT Electric fuzes  
RT PD fuzes

Pyrophoric effects 1904  
BT Weapons effects  
RT Pyrophoric materials  
RT Terminal ballistics

Pyrophoric materials 1107  
RT Propellants  
RT Pyrophoric effects

Pyrotechnics 1901  
NT Flares  
NT Spotting charges  
RT Chemical ammunition  
RT Explosives  
RT Incendiary ammunition

## Q

Qualified products lists (QPL) 0501

Qualitative materiel development  
objectives (QMDO) 0501

QMR  
USE Qualitative materiel require-  
ments (QMR)

Qualitative Materiel Requirements  
(QMR) 0501

UF QMR  
NT Ammunition specifications  
NT Ammunition standards

Quality assurance 1308 1404  
RT Ammunition standards  
RT Quality control

Quality control 1308 1404  
RT Ammunition standards  
RT Quality assurance

# R

Radioactive isotopes 1802  
UF Radioisotopes  
RT Materials technology  
RT Nondestructive testing

Radioisotopes  
USE Radioactive isotopes

Rapid fire gun barrels 1906  
BT Gun barrels  
RT Rapid fire weapons

Rapid fire weapons 1906  
NT Machine guns  
RT Gatling mechanisms  
RT Rapid fire gun barrels  
RT Rate of fire

Rate of fire 1904  
BT Weapon dynamics  
RT Automatic guns  
RT Cyclic rate of fire  
RT Rapid fire weapons

Receivers (guns) 1906  
BT Gun components  
RT Test weapons

Recoilless guns 1906  
NT Recoilless rifles  
RT Gas dynamics  
RT Recoil mechanisms  
RT Weapon dynamics

Recoilless rifles 1906  
BT Recoilless guns  
BT Rifles  
RT Gas dynamics  
RT Recoil mechanisms  
RT Weapon dynamics

Recoil mechanisms 1906  
RT Gun auxiliary equipment  
RT Recoilless guns  
RT Recoilless rifles  
RT Recoil operated guns  
RT Weapon dynamics

Recoil operated guns 1906  
BT Semiautomatic guns  
RT Recoil mechanisms

Reflex collimator gun sights 1905  
BT Optical gun sights  
BT Reflex gun sights  
RT Collimating lenses  
RT Reticles

Reflex gun sights 1905  
BT Optical gun sights  
NT Reflex gun sights  
RT Reticles

Reliability 1404  
RT Life cycle costs  
RT Logistics management  
RT Maintainability

Requests for waivers (RFW) 0501

Resonance 1407  
RT Kinematics  
RT Shock waves  
RT Sound research  
RT Vibration research

Reticles 1402  
RT Gun sight assemblies  
RT Optical gun sights  
RT Reflex collimator gun sights  
RT Reflex gun sights

Revolvers 1906  
BT Guns (ordnance)  
BT Hand weapons  
BT Small arms  
RT Cylinder feed  
RT Gun cylinders  
RT Survival weapons  
RT Yokes

Numbers following main terms correspond to subject categories in TEST

- Rifles 1906  
 BT Guns (ordnance)  
 BT Shoulder weapons  
 BT Small arms  
 NT Carbines  
 NT Recoilless rifles  
 RT Caliber  
 RT Rifle submachine guns  
 RT Rifling (guns)  
 RT Spotting rifles  
 RT Survival weapons
- Rifle submachine guns 1906  
 BT Automatic guns  
 BT Semiautomatic guns  
 RT Machine guns  
 RT Rifles  
 RT Submachine guns
- Rifling (guns) 1906  
 RT Grooves (rifling)  
 RT Gun barrels  
 RT Lands (rifling)  
 RT Rifles  
 RT Rotating bands
- Riot batons 1909  
 BT Nonlethal weapons  
 BT Riot control weapons
- Riot control cartridges 1901  
 RT Chemical ammunition  
 RT Riot control weapons  
 RT Tear gases
- Riot control weapons 1909  
 NT Riot batons  
 NT Shock batons  
 NT Tear gas projectors  
 RT Graded lethality weapons  
 RT Nonlethal weapons  
 RT Police weapons  
 RT Riot control cartridges
- Rocket assisted ammunition 1901  
 BT Projectiles  
 RT Rockets
- Rockets 1907  
 BT Projectiles  
 RT Rocket assisted ammunition
- Rods, cleaning  
 USE Cleaning rods
- Rotary swaging 1308  
 RT Swaging
- Rotating bands 1901  
 RT Rifling (guns)  
 RT Spin stabilized ammunition
- Round nose bullets 1901  
 BT Bullets
- Rubber compositions (natural) 1110  
 RT Materials technology
- Rubber compositions (synthetic) 1110  
 RT Materials technology
- Rust prevention 1308
- S**
- Sabots 1901  
 RT Bullets  
 RT Flechettes
- Safeties (guns) 1906

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USE = Use preferred term; UF = Used For; BT = Broader Term; NT = Narrower Term;  
 RT = Related Term

- Safeties (cont'd)
  - UF Safety levers
  - UF Safety locks
    - RT Weapon firing mechanisms
- Safety and arming 1901
  - UF Arming and safety
    - RT Explosives
  - RT Fuzes
- Safety levers
  - USE Safeties (guns)
- Safety locks
  - USE Safeties (guns)
- Sand traps 1402
  - BT Test facilities
- Screen perforation test data 1904
  - BT Ballistic test data
  - RT Screen perforation tests
- Screen perforation tests 1402
  - BT Ballistic tests
  - RT Screen perforation test data
  - RT Terminal ballistics
- Sears 1906
  - RT Weapon firing mechanisms
- Selfloading guns 1906
  - UF Automatics
  - BT Automatic guns
- Semiautomatic guns 1906
  - BT Guns (ordnance)
    - NT Blowback operated guns
    - NT Gas operated guns
    - NT Recoil operated guns
    - NT Rifle submachine guns
    - RT Automatic guns
    - RT Mode of fire
    - RT Small arms
- Semi wadcutters 1901
  - BT Bullets
  - RT Wadcutters
- Shaped charges 1901
  - RT Antitank ammunition
  - RT Armor piercing ammunition
  - RT Explosive forming
- Shells
  - USE Cartridges (explosives)
  - USE Shotshells
- Shock batons 1909
  - BT Nonlethal weapons
  - BT Riot control weapons
- Shock waves 2001 2004
  - UF Mach waves
  - RT Aerodynamics
  - RT Ballistics
  - RT Resonance
  - RT Vibration research
- Shop maintenance 1505
  - UF Depot maintenance
  - BT Logistics management
  - RT Field maintenance
  - RT Maintainability
- Shot 1901
  - UF Buckshot
  - BT Projectiles
  - RT Cartridges
  - RT Shotguns
  - RT Shotshells
- Shotguns 1906
  - BT Guns (ordnance)
  - BT Shoulder weapons
  - BT Small arms
  - RT Forcing cones

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Numbers following main terms correspond to subject categories in TEST

- Shotshells 1901  
   UF Shells  
     RT Shot  
     RT Wad
- Shoulder weapons 1906  
   BT Small arms  
   NT Carbines  
   NT Rifles  
   NT Shotguns  
   NT Submachine guns
- Sight assemblies  
   USE Gun sight assemblies
- Sights  
   USE Gun sights
- Silencers 1906  
   RT Gun auxiliary equipment
- Silicone fluorides  
   USE Fluorosilicones
- Simulation (computers)  
   USE Computer simulation
- Simulation, physical  
   USE Physical simulation
- Slide assemblies 1906  
   BT Gun components  
   RT Action bars
- Small arms 1906  
   BT Guns (ordnance)  
   NT Grenade launchers  
   NT Hand weapons  
   NT Personal defense weapons  
   NT Pistols  
   NT Revolvers  
   NT Rifles  
   NT Shotguns  
   NT Shoulder weapons  
     RT Automatic guns  
     RT Cartridges  
     RT Infantry weapons  
     RT Machine guns  
     RT Munitions industry  
     RT Projectiles  
     RT Semiautomatic guns  
     RT Small arms ammunition  
     RT Small arms design  
     RT Weapon fabrication
- Small arms (foreign)  
   USE Foreign small arms
- Small arms accessories  
   USE Gun auxiliary equipment
- Small arms ammunition 1901  
   RT Antimateriel ammunition  
   RT Antipersonnel ammunition  
   RT Armor piercing ammunition  
   RT Armor piercing incendiary ammunition  
   RT Armor piercing incendiary tracer ammunition  
   RT Ball ammunition  
   RT Cartridges  
   RT Grenades  
   RT High explosive ammunition  
   RT High explosive antitank ammunition  
   RT High explosive incendiary ammunition  
   RT Incendiary ammunition  
   RT Magazines (ammunition)  
   RT Small arms  
   RT Spotting charges  
   RT Tracer ammunition  
   RT Tracers (ordnance)
- Small arms design 1906  
   RT Small arms  
   RT Weapon dynamics
- Smokeless powder 1901  
   BT Propellants
- Sniper rifles 1906  
   BT Point fire weapons
- Soft point bullets 1901  
   BT Bullets
- Soldering 1308  
   BT Joining  
   RT Bonding  
   RT Metals

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- Solid propellants 1901
  - BT Propellants
  - RT Liquid propellants
  - RT Propellant grains
  - RT Propellant powders
- Solid state bonding
  - USE Bonding
- Solvents 1111
  - BT Cleaning agents
- Sound research 1402
  - RT Resonance
  - RT Vibration research
- Special applications materials 1107
  - BT Materials technology
- Spectroscopy 1402
- Spin stabilized ammunition 1901
  - RT Flechettes
  - RT Rotating bands
- Spitzer bullets 1901
  - BT Bullets
- Spotting charges 1901
  - BT Pyrotechnics
  - RT Flares
  - RT Spotting rifles
- Spotting rifles 1906
  - RT Rifles
  - RT Spotting charges
  - RT Tracers (ordnance)
- Spray coating 1308
  - BT Coating processes
  - NT Flame spraying
  - NT Plasma spraying
- Spring dynamics 2012
- Springs (elastic) research 1309
- Standardization 1505
  - RT Component standardization
- Star gauges 1402
  - BT Test equipment
  - RT Gauges
- Steel cartridge cases 1901
  - BT Cartridge cases
- Stocks
  - USE Gun stocks
- Strain gauges 1402
  - RT Gauges
  - RT Piezoelectric gauges
  - RT Strain rate effects
- Strain rate effects 2012
  - BT Materials technology
  - BT Weapon dynamics
  - RT Pressure stress analysis
  - RT Strain gauges
  - RT Stress analysis
- Stress analysis 1402
  - BT Materials technology
  - NT Pressure stress analysis
  - NT Thermal stress analysis
  - RT Autofrettage
  - RT Corrosion analysis
  - RT Elastoplastic analysis
  - RT Erosion analysis
  - RT Strain rate effects
- Strikers (guns) 1906
  - RT Firing pins
  - RT Hammers (guns)
- Stripping test data 1904
  - BT Ballistic tests
  - RT Stripping test data
- Stroboscopic photography 1405
  - BT High speed photography
  - RT Ballistic photography
  - RT Photography

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Numbers following main terms correspond to subject categories in TEST

Submachine guns 1906  
 BT Shoulder weapons  
 RT Machine guns  
 RT Rifle submachine guns

Survival rifles  
 USE Survival weapons

Survival rifle shotguns  
 USE Survival weapons

Survival weapons 1906  
 UF Survival rifles  
 UF Survival rifle shotguns  
 RT Infantry weapons  
 RT Pistols  
 RT Revolvers  
 RT Rifles

Swaging 1308  
 BT Materials technology  
 RT Bullet swaging  
 RT Metals  
 RT Rotary swaging

System development plans (SDP) 0501

Systems analysis 0501

Systems engineering 0501

## T

Tactical warfare 1507

Targets (ordnance) 1402  
 BT Test equipment  
 RT Infantry training  
 RT Target vulnerability

Target vulnerability 1507  
 BT Vulnerability  
 RT Targets (ordnance)  
 RT Terminal effects  
 RT Weapons effects

Tear gases  
 BT Chemical ammunition  
 BT Incapacitating agents  
 RT Riot control cartridges  
 RT Tear gas projectors

Tear gas projectors 1901  
 BT Nonlethal weapons  
 BT Riot control weapons  
 RT Incapacitating agents  
 RT Tear gases

Technical data packages (TDP) 0501

Temperature and humidity control  
 rooms 1402  
 BT Test facilities

Temperature effects 1402  
 BT Materials technology  
 BT Weapon dynamics  
 RT Thermal stress analysis

Terminal ballistics 1904  
 BT Exterior ballistics  
 NT Wound ballistics  
 RT Penetration tests  
 RT Pyrophoric effects  
 RT Screen perforation tests

Terminal effects 1907  
 BT Weapons effects  
 RT Target vulnerability  
 RT Wound ballistics

Test equipment 1402  
 UF Ballistic test equipment  
 UF Proof test equipment  
 UF Test instrumentation  
 UF Weapons test equipment  
 NT Air gauges  
 NT Ballistic cameras  
 NT Bullet catchers  
 NT Calorimeters  
 NT Chronometers  
 NT Gauges  
 NT Headspace gauges

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- Test equipment (cont'd)
- NT High speed cameras
  - NT Powder determinators
  - NT Pressure gauges
  - NT Primer drop test machines
  - NT Star gauges
  - NT Targets (ordnance)
  - NT Test weapons
    - RT Ballistic tests
    - RT Proof tests
    - RT Test facilities
    - RT Test ranges
    - RT Weapons tests
- Test facilities 1402
- UF Ballistic test facilities
  - UF Proof test facilities
  - UF Weapons test facilities
    - NT Primer sensitivity rooms
    - NT Sand traps
    - NT Temperature and humidity control rooms
    - NT Test ranges
    - NT Water traps
      - RT Ballistic tests
      - RT Proof tests
      - RT Proving grounds
      - RT Test equipment
      - RT Weapons tests
- Test instrumentation
- USE Test equipment
- Test, measurement and diagnostic equipment
- USE TMDE
- Test range automation 1402
- RT Test ranges
- Test ranges 1402
- BT Test facilities
    - NT Ballistic ranges
    - RT Proving grounds
    - RT Test equipment
    - RT Test range automation
- Test weapons 1402
- BT Test equipment
    - RT Ballistic tests
    - RT Receivers (guns)
    - RT Weapons tests
- Thermal stress analysis 1402
- BT Stress analysis
    - RT Corrosion analysis
    - RT Pressure stress analysis
    - RT Temperature effects
- Thermodynamics 2013
- Thermo mechanical behavior (components) 2012
- Thermo mechanical behavior (materials) 2012
- Thin alloys 1106
- Time delay fuzes
- USE Time fuzes
- Time fuzes 1901
- UF Time delay fuzes
    - BT Fuzes
      - RT Fuze setters
      - RT VT fuzes
- TMDE 1402
- UF Test, measurement and diagnostic equipment
    - RT Diagnostic systems
- Tracer ammunition 1901
- RT Bullets
  - RT Small arms ammunition
  - RT Tracers (ordnance)
  - RT Trace tests
- Tracers (ordnance) 1901
- RT Small arms ammunition
  - RT Spotting rifles
  - RT Tracer ammunition
  - RT Trace tests



Trace test data 1904  
BT Ballistic test data  
RT Trace tests

Trace tests 1402  
BT Ballistic tests  
RT Tracer ammunition  
RT Tracers (ordnance)  
RT Trace test data

Training ammunition 1901  
NT Frangible ammunition  
RT Blank cartridges  
RT Infantry training

Trajectories  
USE Ballistics

Transition ballistics  
USE Exterior ballistics

Trigger assemblies  
USE Trigger group

Trigger bars 1906  
RT Trigger group

Trigger group 1906  
UF Trigger assemblies  
BT Gun components  
RT Trigger bars  
RT Trigger guards  
RT Trigger stops

Trigger guards 1906  
RT Trigger group

Trigger pull 1906  
RT Triggers

Triggers 1906  
RT Trigger pull  
RT Weapon firing mechanisms

Trigger stops 1906  
RT Trigger group

## U

Ultrasonic imaging 1402  
BT Nondestructive testing

Ultraviolet spectrometers 1402

## V

Value engineering 0501

Vapor deposition 1308  
BT Coating processes  
RT Coatings

Variable time fuzes  
USE VT fuzes

Velocity and pressure ranges 1402  
BT Ballistic ranges  
RT Pressure tests  
RT Velocity tests

Velocity test data 1904  
BT Ballistic test data  
RT Velocity tests

Velocity tests 1402  
BT Ballistic tests  
RT Velocity and pressure ranges  
RT Velocity test data

Vibration research 1402  
BT Kinematics

## Vibration research (cont'd)

- RT Resonance
- RT Shock waves
- RT Sound research

## VT fuzes 1901

- UF Variable time fuzes
- BT Fuzes

- RT Electric fuzes
- RT PD fuzes
- RT Time fuzes

## Vulnerability 1407

- NT Target vulnerability
- RT Weapons effects

## W

## Wad 1901

- RT Shotshells

## Wadcutters 1901

- BT Bullets
- RT Semi wadcutters

## Warheads 1901

## Water cooled machine guns 1906

- BT Machine guns

## Waterproof test data 1904

- BT Ballistic test data
- RT Waterproof tests

## Waterproof tests 1402

- BT Ballistic tests
- RT Waterproof test data

## Water traps 1402

- BT Test facilities

## Weapon designations 1906

- NT Caliber
- NT M
- NT MK

## Weapon dynamics 1906

- UF Weapon functioning
  - NT Belt pull
  - NT Cartridge ejection velocity
  - NT Cyclic rate of fire
  - NT Gas dynamics
  - NT Mode of fire
  - NT Muzzle velocity
  - NT Projectile dispersion
  - NT Rate of fire
  - NT Strain rate effects
  - NT Temperature effects
    - RT High speed photography
    - RT Kinematics
    - RT Recoilless guns
    - RT Recoilless rifles
    - RT Recoil mechanisms
    - RT Recoil operated guns
    - RT Small arms design

## Weapon fabrication 1308

- UF Weapon manufacturing
  - RT Munitions industry
  - RT Product improvement
  - RT Small arms

## Weapon firing mechanisms 1906

- UF Gun firing mechanisms
  - BT Gun components
    - RT Firing mechanisms
    - RT Firing pins
    - RT Hammers (guns)
    - RT Safeties (guns)
    - RT Seals
    - RT Strikers (guns)
    - RT Triggers

## Weapon functioning

- USE Weapon dynamics

## Weapon manufacturing

- USE Weapon fabrication

## Weapon mounts 1906

- BT Gun auxiliary equipment
- NT Bipods

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Numbers following main terms correspond to subject categories in TEST

Weapons effects 1904  
NT Pyrophoric effects  
NT Terminal effects  
RT Target vulnerability  
RT Vulnerability

Weapons test data 1402  
NT Accuracy test data  
RT Ballistic test data  
RT Weapons test

Weapons test equipment  
USE Test equipment

Weapons test facilities  
USE Test facilities

Weapons tests 1402  
NT Accuracy tests  
RT Ballistic tests  
RT Proof tests  
RT Test equipment  
RT Test facilities  
RT Test weapons  
RT Weapons test data

Weapon systems 1906

Welding 1308  
BT Joining  
RT Bonding  
RT Metals

Windage scale 1906  
RT Gun sight assemblies

Wound ballistics  
BT Ballistics  
BT Terminal ballistics  
RT Terminal effects

# X

Xeroradiography 1402  
BT Nondestructive testing

X-ray diffraction 2006  
UF X-ray diffractometers  
BT Nondestructive testing

X-ray diffractometers  
USE X-ray diffraction

X-ray radiography 1402  
BT Nondestructive testing

# Y

Yokes 1906  
UF Cranes (guns)  
RT Revolvers

Please help us evaluate this directory. When you use it - successfully or unsuccessfully - fill out, tear off, and mail us one of these cards. Your response will determine the nature and number of subsequent editions.

SATIN Response Survey		SATIN Response Survey	
Name (optional)	Tel. No.	Name (optional)	Tel. No.
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<p>2. This required (no.) phone calls</p> <p>Information Sought was:</p> <p>Technical <input type="checkbox"/> Management <input type="checkbox"/></p> <p>General Background <input type="checkbox"/></p>		<p>2. This required (no.) phone calls</p> <p>Information Sought was:</p> <p>Technical <input type="checkbox"/> Management <input type="checkbox"/></p> <p>General Background <input type="checkbox"/></p>	
<p>3. Information Sought was:</p> <p>Government Personnel <input type="checkbox"/></p> <p>Information Handling Activity <input type="checkbox"/></p> <p>Industrial Source <input type="checkbox"/></p>		<p>3. Information Sought was:</p> <p>Government Personnel <input type="checkbox"/></p> <p>Information Handling Activity <input type="checkbox"/></p> <p>Industrial Source <input type="checkbox"/></p>	
<p>4. Information source if found:</p> <p>Verbal answer to specific question <input type="checkbox"/></p> <p>Referral to individual in same organization <input type="checkbox"/> in different organization <input type="checkbox"/></p> <p>Referral to an organization <input type="checkbox"/> Reference to document(s) <input type="checkbox"/></p> <p>Document(s) forwarded by Source <input type="checkbox"/></p>		<p>4. Information source if found:</p> <p>Verbal answer to specific question <input type="checkbox"/></p> <p>Referral to individual in same organization <input type="checkbox"/> in different organization <input type="checkbox"/></p> <p>Referral to an organization <input type="checkbox"/> Reference to document(s) <input type="checkbox"/></p> <p>Document(s) forwarded by Source <input type="checkbox"/></p>	
<p>5. Received information was:</p> <p>Verbal answer to specific question <input type="checkbox"/></p> <p>Referral to individual in same organization <input type="checkbox"/> in different organization <input type="checkbox"/></p> <p>Referral to an organization <input type="checkbox"/> Reference to document(s) <input type="checkbox"/></p> <p>Document(s) forwarded by Source <input type="checkbox"/></p>		<p>5. Received information was:</p> <p>Verbal answer to specific question <input type="checkbox"/></p> <p>Referral to individual in same organization <input type="checkbox"/> in different organization <input type="checkbox"/></p> <p>Referral to an organization <input type="checkbox"/> Reference to document(s) <input type="checkbox"/></p> <p>Document(s) forwarded by Source <input type="checkbox"/></p>	
<p>6. Comments or recommendations for revisions or additions:</p>		<p>6. Comments or recommendations for revisions or additions:</p>	

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